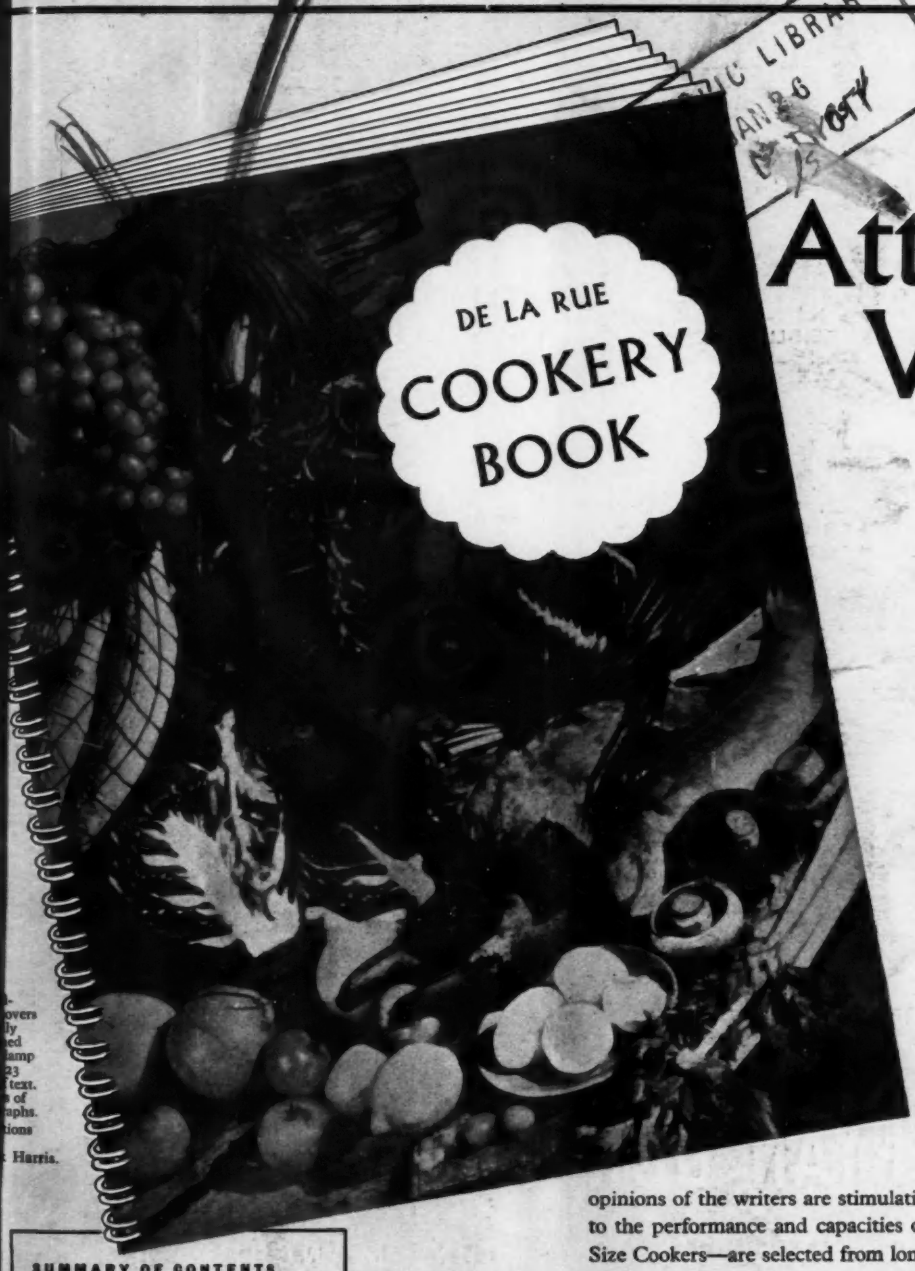
NOLOGY DEPT.]

Gas Journal

VOL. 277. 106TH YEAR. LONDON, JANUARY 6, 1954. NO. 4727. PRICE 1/3



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SUMMARY OF CONTENTS

Soups and Sauces	by Ambrose Heath
Fish	„ Elizabeth Craig
Meat	„ Jean Conil
Vegetables	„ Gretel Beer
Snacks	„ Frances Dale
Cakes and Pastries	„ Marguerite Patten
Sweets	„ Rosemary Hume
Preserving	by Mrs. Arthur Webb

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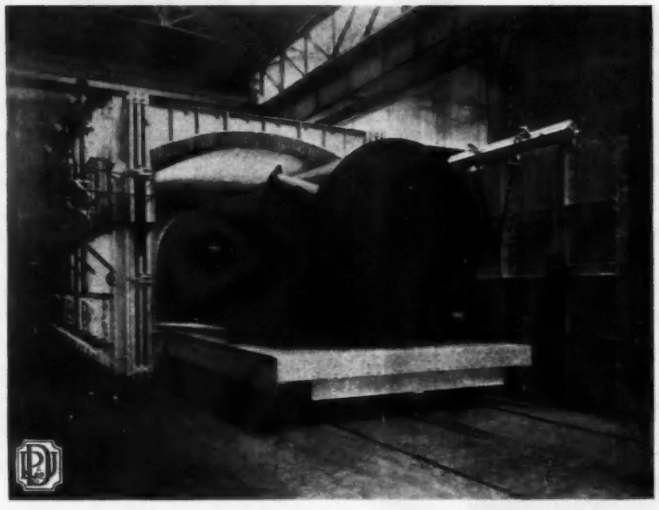

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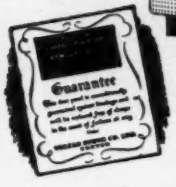

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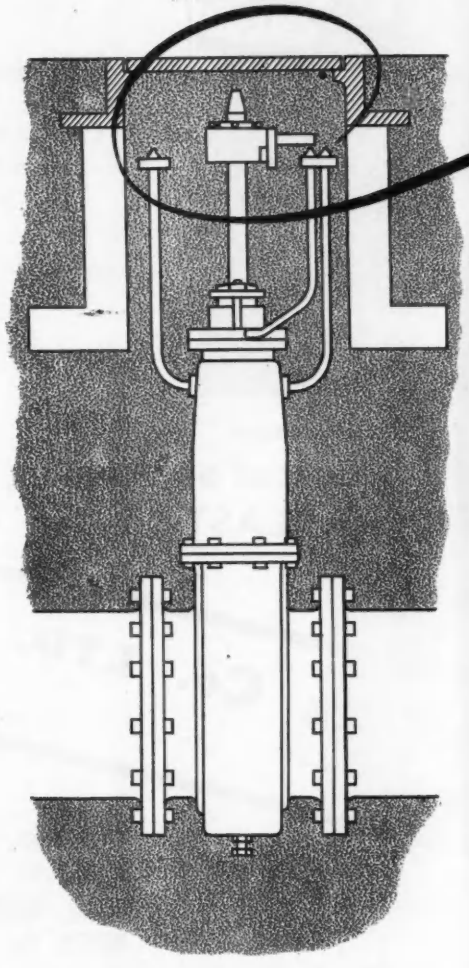

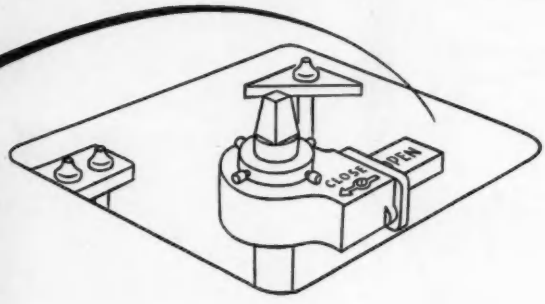

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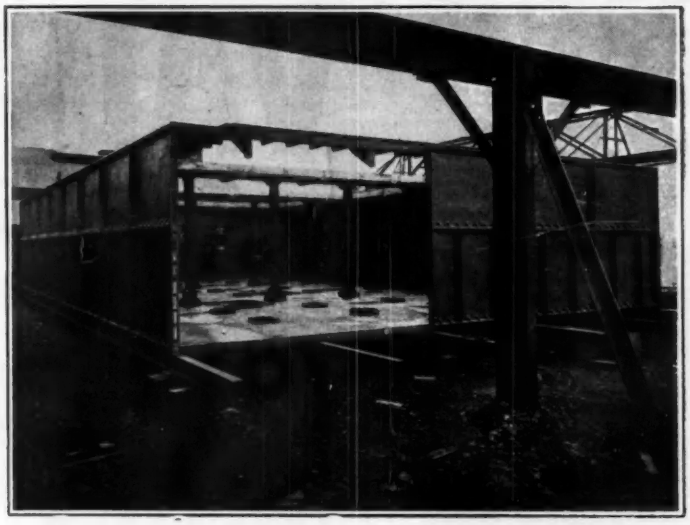

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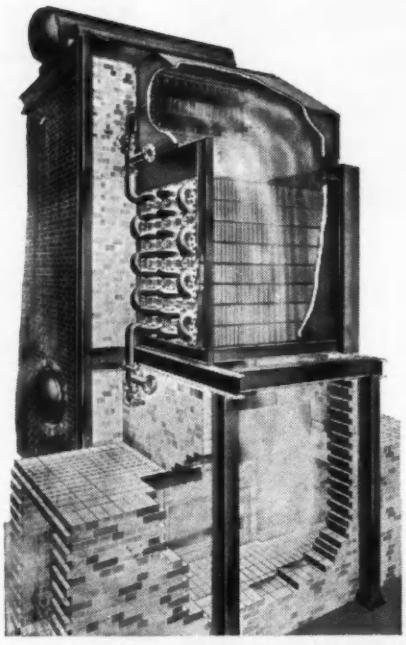

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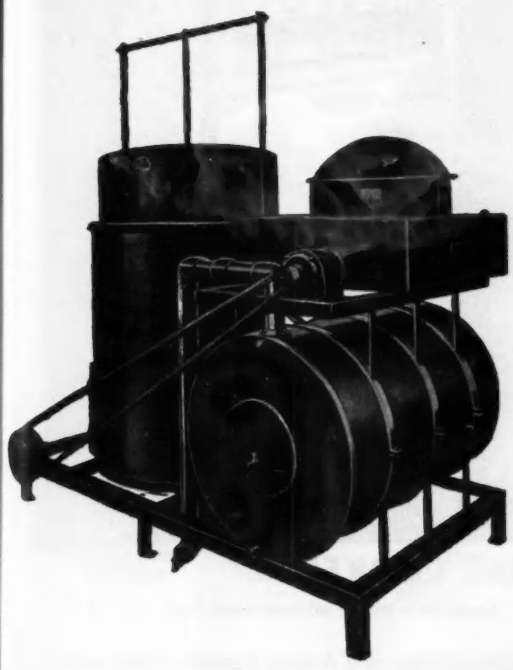

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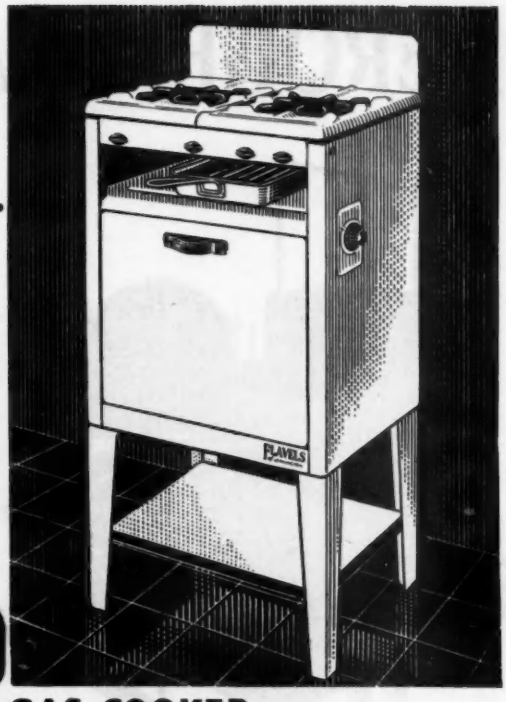

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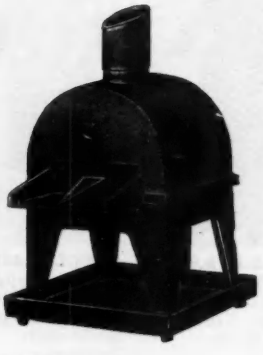

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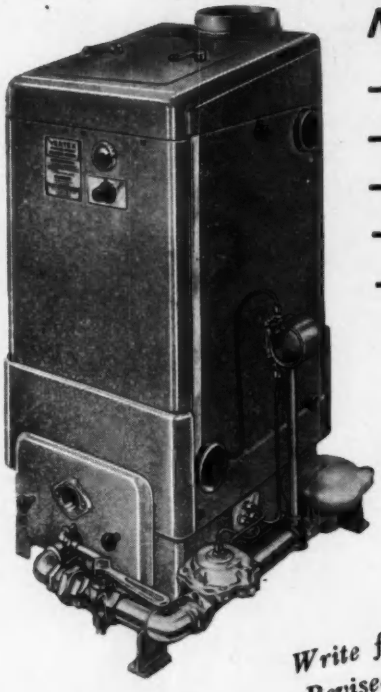

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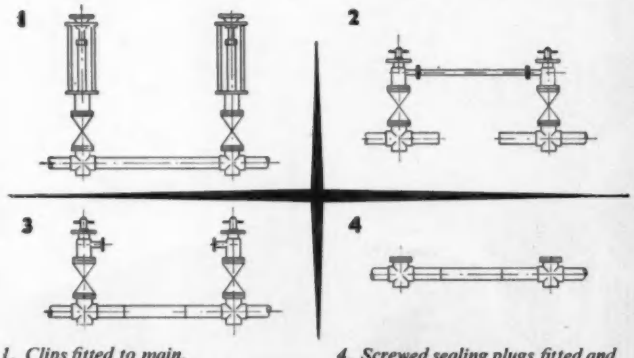

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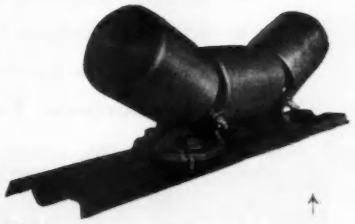

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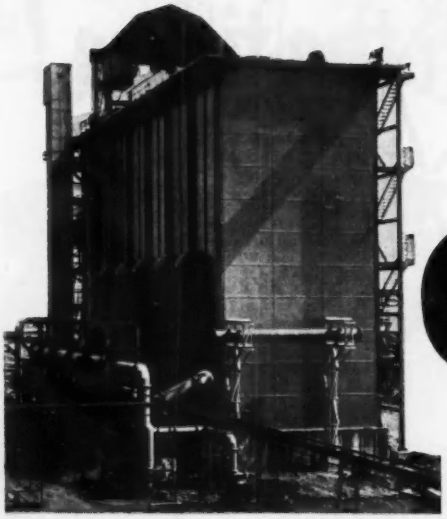

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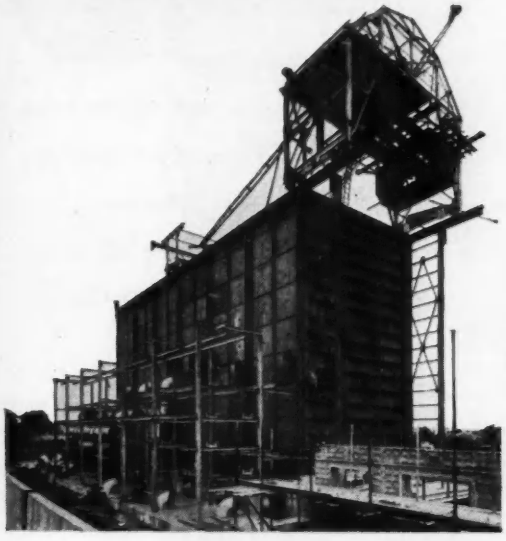
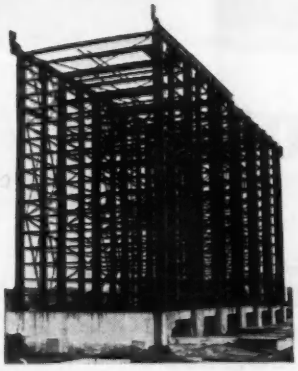


After

The unequalled technical resources of the Balfour organisation are at the service of those requiring detailed information on application of Tower Box purifiers or other gas equipment to their needs.



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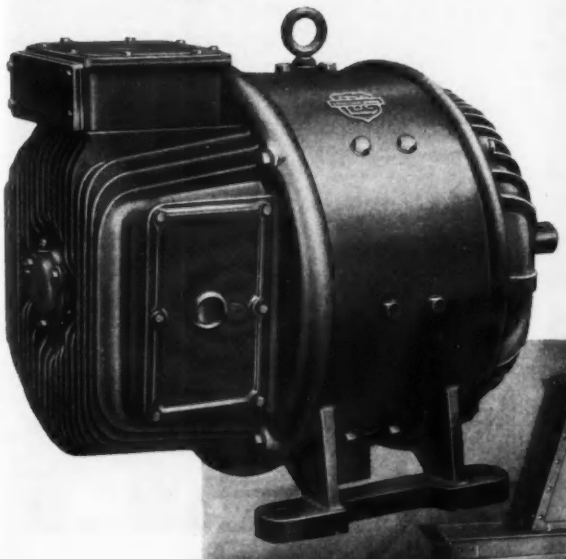

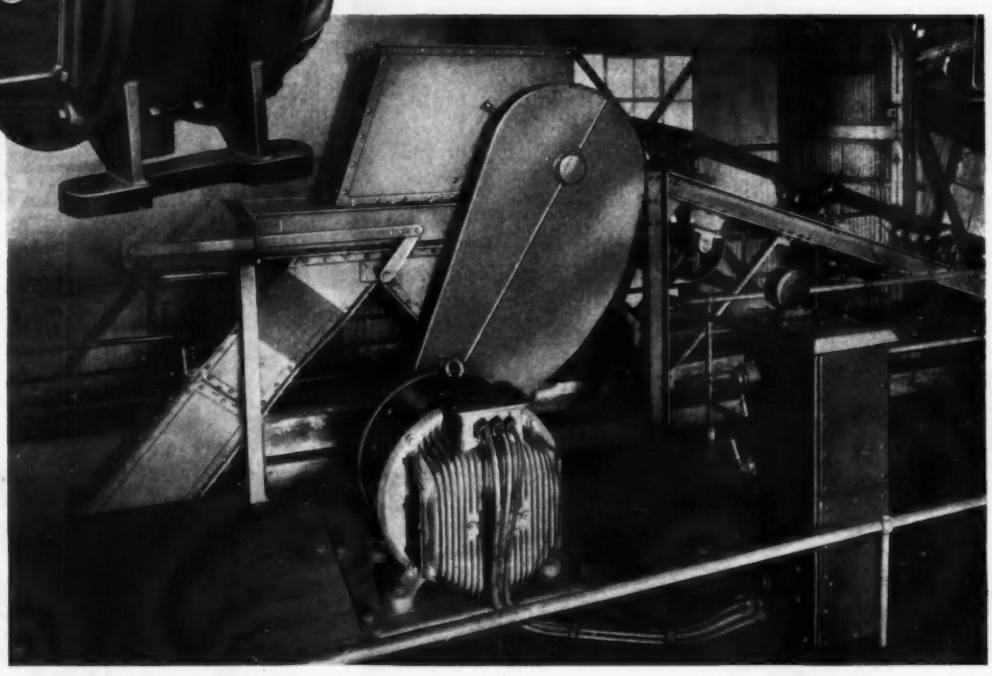

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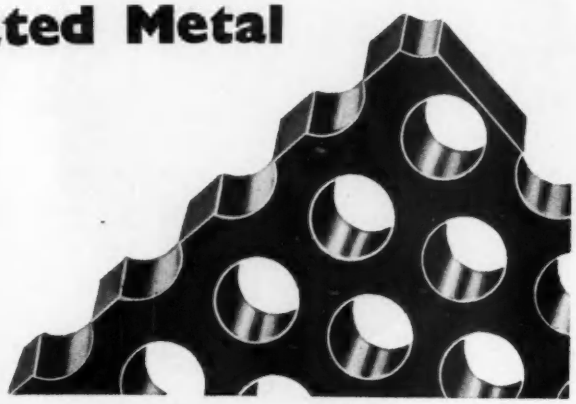

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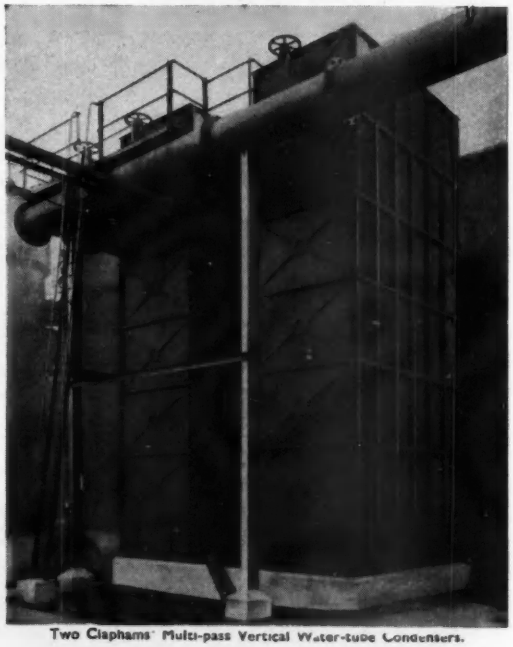

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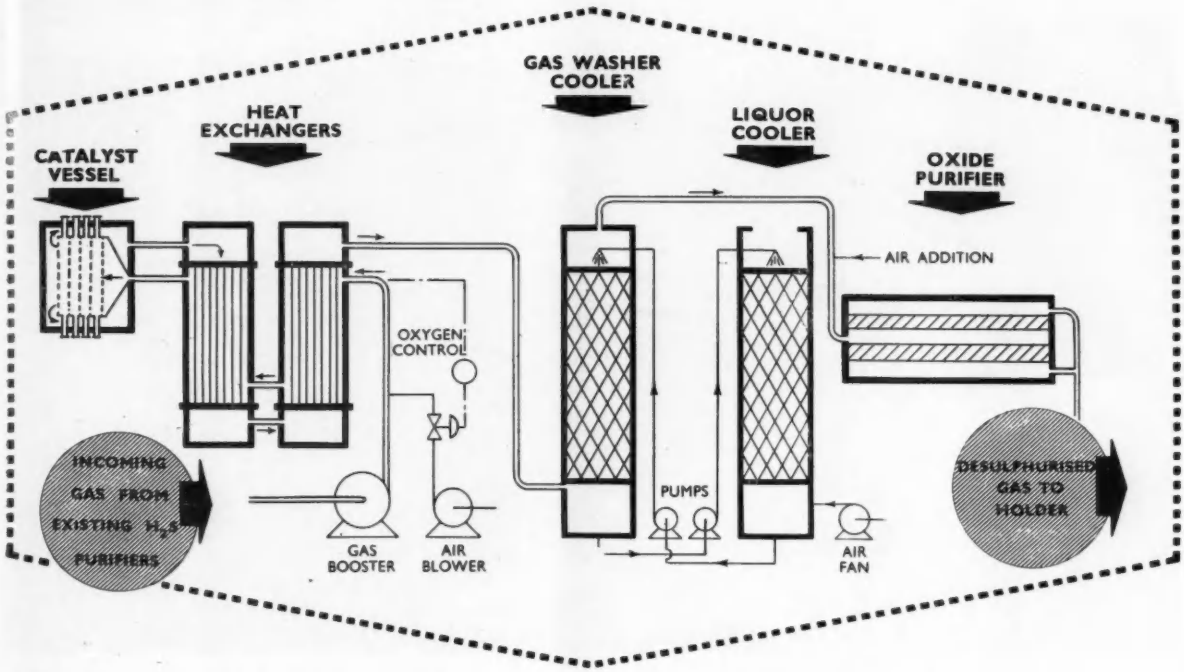

The advisability of reducing the organic sulphur content of town gas has long been stressed in Institution of Gas Engineers' Communications, the first in 1936, and in the Heyworth Report on the Gas Industry. Gas of low sulphur content would reduce corrosion of domestic water heating appliances, extend the field of use of flueless heaters, and remove difficulties met in special furnace applications, such as scaling in heat treatment, and bloom in glass finishing.

The North Thames Gas Board's process has been developed from the pilot plant at Fulham, to the first works scale plant of capacity 1.5 million cu. ft./day at Harrow. This plant, which has operated since 1938, has demonstrated the success and reliability of the process, which will reduce the organic sulphur content of town gas to below the recommended limit of 10 grains/100 cu. ft. without recourse to benzole extraction, or to 3-5 grains/100 cu. ft. in conjunction with a benzole plant.

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The gas is finally cooled and scrubbed free from oxides of sulphur, the alkaline scrubbing solution being cooled and recirculated. A catch purifier is required to remove traces of hydrogen sulphide.

The process is covered by B.P.489,398 and subsequent patents.

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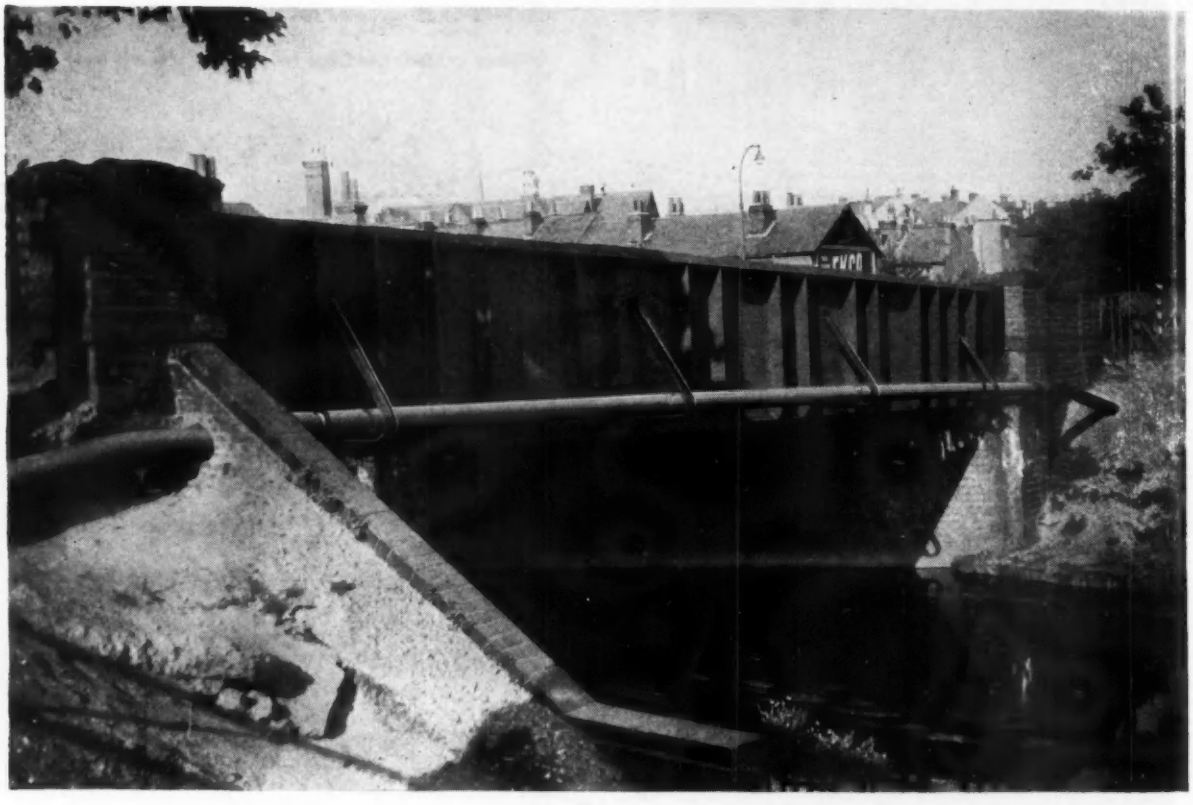

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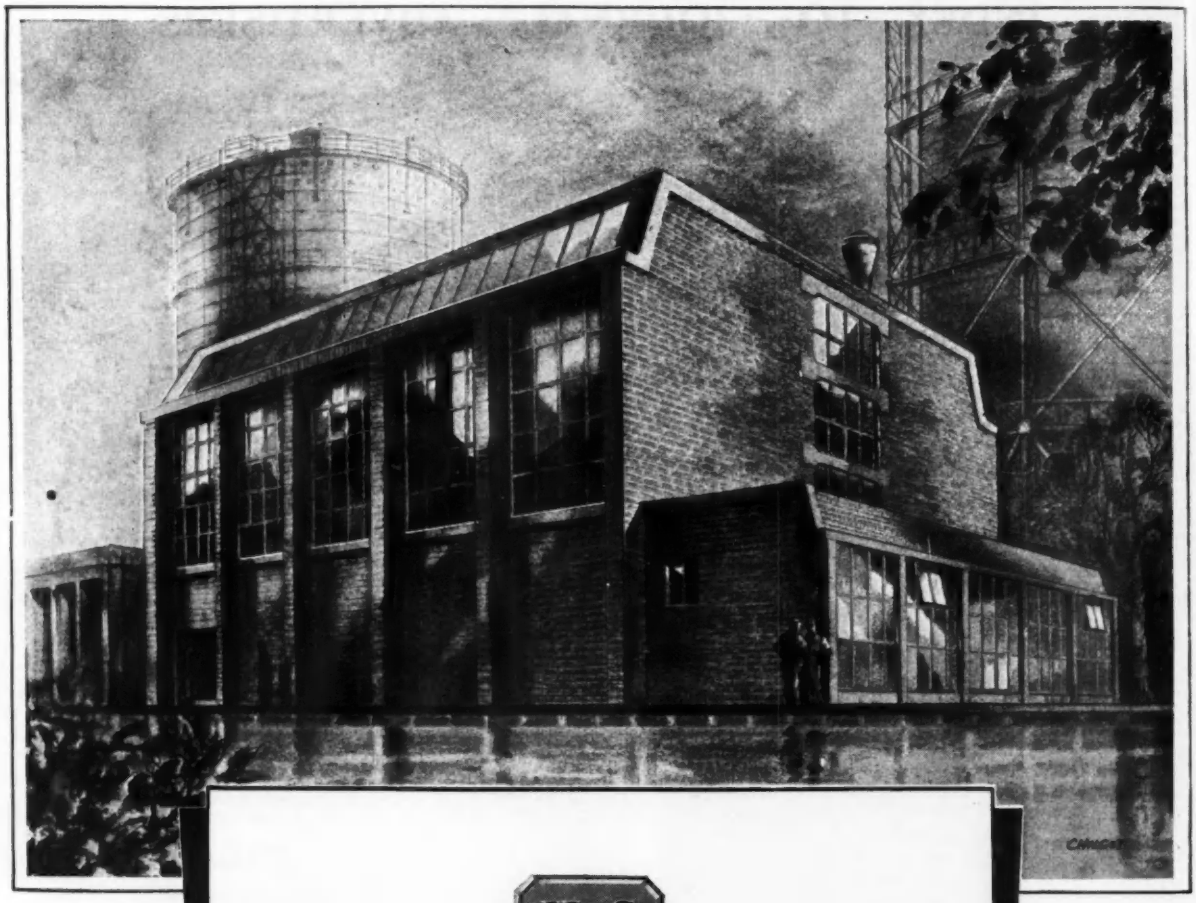

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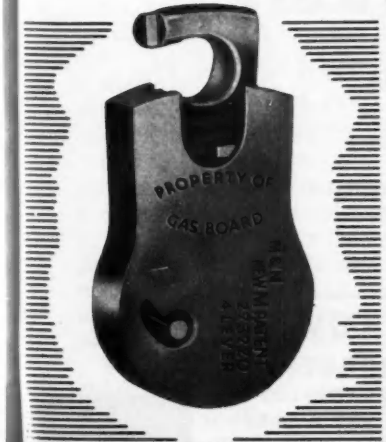

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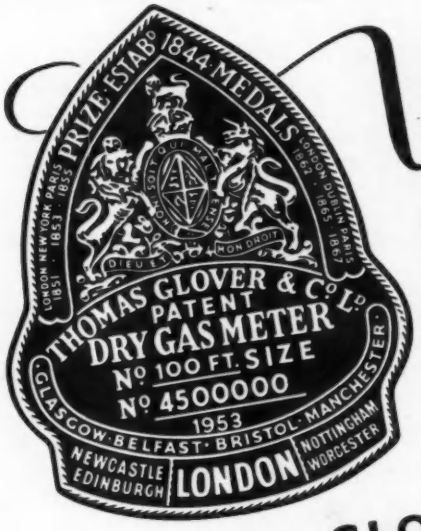

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Oil Gasification
Segas and H. & G.
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Gas Journal

VOL. 277. No. 4727 106TH YEAR January 6, 1954

HEAVY OIL FOR GAS-MAKING

The construction of large oil refineries in this country gives impetus to a revival of interest in the gas industry concerning the practicability of substituting heavy or 'black' oils for gas oil in the production of town gas. Later in this issue of the 'JOURNAL' we describe a new heavy oil gasification process which has been demonstrated successfully as part of a carburetted water gas plant at the Saltley works, Birmingham, of the West Midlands Gas Board.

Heavy or 'black' oil is a term applied generally to the heavy residues of the petroleum refinery; it may or may not be mixed with lighter products to give fluidity, but is by no means a product of consistent quality. Prior to the introduction of catalytic cracking plant now in general use in oil refineries, heavy oil was usually a straight-run product rich in paraffins. Now, however, it consists almost invariably of mixtures of residues and 'cracked' products known as cycle oil, which has a poor gas enrichment value, although its quality as a burning oil is not impaired. It follows, therefore, that under present-day oil refinery conditions, a heavy oil which is an entirely satisfactory product as a fuel may be of low value as a raw material in carburetted water gas manufacture.

Accordingly, the gas industry purchaser is faced with the difficulty that the product which he may purchase is most variable in those qualities which are of the greatest interest to him; and, furthermore, he can obtain no assurance that poor enriching value will be offset by a corresponding reduction in price.

It would appear that with increasing demands for gas oil and diesel oil for traction and other purposes, it must be in the national interest for the gas industry to use heavy oil rather than gas oil in its gas-making processes, and now that there exist processes of proved reliability and efficiency, it is to be hoped that the oil industry will take steps to provide a heavy oil which is suited to the requirements of the gas industry.

The plant at the Saltley works is a Humphreys & Glasgow carburetted water gas set. It is fully automatic and has a capacity of about 2,500,000 cu.ft. a day. It has already gasified over 1,200 tons of heavy oil of widely varying characteristics including viscosities ranging from 500 to 1,000 second and Conradson carbon up to 10.5% in the production of carburetted water gas of a quality טכ to 500 B.Th.U. per cu.ft. The plant, as related in our description, has been modified by the makers and has the great advantage that the necessity for periodical interruption of the gas-making process for the manual removal of carbon deposits is eliminated.

The plant at the Sydenham works of the South Eastern Gas Board, also illustrated and described on later pages, is a direct oil-cracking process depending on the use of catalyst consisting of bauxite, calcium carbonate, and bentonite. The 'Segas' process, as it is named (an equally appropriate name would have been 'Soumet') is the outcome of outstanding experimental work at the Old Kent Road works of the former South Metropolitan Gas Company. Full reference to this pioneering effort is made on p. 33; and the whole represents a further example of collaboration between the scientists engaged by a gas undertaking and the ready grasp of scientists emloyed by a contracting firm with great facilities at its command. The plant at Sydenham was designed jointly by the South Eastern Gas Board and the Power-Gas Corporation, Ltd. Gas-making was started in February of last year. It is a comparatively small unit now producing 800,000 cu.ft. daily of a gas having a calorific value of between 480 and 508 B.Th.U. per cu.ft. It must be borne in mind that this gas is being produced from 'black' oil alone. We would add that Humphreys & Glasgow, Ltd., are also vitally interested in the production of gas with only 'black' oil as the raw material. All this is explained in our article; and it is pleasant to record the welcome gain towards flexibility in gas manufacture which these eminent firms, among others, are, in practical collaboration with the gas boards, making possible.

THE PRICE OF FUEL

'The ordinary open fire must be regarded as an anachronism. Writing up coal prices by £1 to be in closer accordance with its real value, and by another £1 to take account of smoke pollution, we find that the best type of modern fire costs the community about half the ordinary grate for a given amount of heat . . . The all-electric estate is an abomination . . . Designs for houses which do not incorporate gas facilities and solid-fuel space and water heating should be prohibited.' The foregoing is from 'The Price of Fuel' by I. M. D. Little, Fellow of Nuffield College, Oxford. It is published by

Geoffrey Cumberlage, Oxford University Press, and the price is 12s. 6d.

The author makes it clear that his book was written in the belief that the Ridley Committee failed to give the emphatic lead which the evidence before it justified. In any case ' not one of its more important recommendations has been put into effect. And the author maintains that the failures of the nationalised industries are those of pricing policy—failures to set up a mechanism which will properly reflect the need for more or less output, and will best guide consumers to an efficient use of what is produced. The conclusion is drawn that, if the Government is to have a national fuel policy in relation to the fuel industries—over and above merely telling them to do what is right—then it must to a large extent take the form of co-ordinating their price policies, and, if required, issuing directives to secure that co-ordination. It is argued that the price of coal be raised to a level which would roughly equate supply and demand; that the prices of different grades in different locations should also be such as to equate supply and demand; and that prices should be brought into equality with marginal cost, as soon as increased supply or reduced demand makes this possible.

It is also recommended that there be a complete reform of electricity tariffs, every consumer being brought on to either a time-of-day or a seasonal tariff. ' The electricity industry has completely failed to set up a pricing system which will enable it to produce amounts of electricity which are in the national interest. It is interested only in selling as much as possible, consistent with covering total costs, and not in the least in selling the right amounts. Since it could both sell the right amount and also break even, it has not the excuse, like the N.C.B., that central government action is essential to a correct policy.' The argument is advanced that the B.E.A. should have recognised that there was a problem of selling the right amount of electricity, and studied it. In fact, largely as a result of the tradition of rivalry with the gas industry (' anyone can see that this is not dead by reading the evidence of these industries to the Ridley Committee '), it has completely failed to do so. There seems to be no probability that it will do so in the future. In such circumstances, declares the author, since the gas and electricity industries will not co-ordinate themselves, it must be done for them. It is therefore suggested that the Minister of Fuel and Power should freely use his power of direction to ensure this co-ordination. To do this, ' he would probably require the advice and support of a committee, which should be completely independent of the two industries, but which would have powers to demand from them all the information and technical assistance which it required.' It is argued that a committee should be set up dealing only with gas and electricity, and consisting of independent members of distinction, including at least one economist of repute, as well as one or more of the Ministry's economic staff. It should be able to call on the commercial staff of the gas and electricity industries for consultation, but it should not include them as members. The Minister, with the advice of this committee, should lay down the general tariff principles to be adopted.

The proposal is not new. It follows the lines of that of Messrs. H. A. Clegg (Fellow of Nuffield College) and T. E. Chester (Acton Society Trust) in *The Future of Nationalisation*, who suggested the setting-up of a Gas Commission. This book was reviewed in the ' GAS JOURNAL ' of April 15, 1953. Mr. Little goes further than this in a footnote to his general recommendation —*i.e.*, the possibility of the establishment of a Gas and Electricity Commission, the merging of the Gas Council with a body corresponding to the old Electricity Commissioners. Such a step would, of course, require new and elaborate legislation. But the general arguments of these authors tally to some extent with the recommendation of the British Team on Conservation of Heat, Fuel, and Energy (' GAS JOURNAL,' September 9, 1953, p. 642) that the Government should make a declaration on the broad policy it intends to follow in regard to fuel and power and that it should enact legislation to create a permanent and non-political Fuel and Power Board.

SULPHATE OF AMMONIA

The chances that the manufacture and use of sulphate of ammonia will decline as a result of the increasing interest which is being shown in the direct application of ammoniacal liquor as a fertiliser in agriculture are remote. According to the 33rd annual report of the British Sulphate of Ammonia Federation (covering the 56th year of sulphate propaganda under various auspices) which we summarise on another page there was an increase in United Kingdom deliveries for agricultural consumption from 547,607 tons in 1951-52 to 650,157 tons in the 12 months ended last June. This total compares with the insignificant figure of 128,000 tons 30 years ago, and the report notes that in the year under review the total deliveries by the Federation in home and export markets for the first time exceeded 1 mill. tons of sulphate of ammonia. Turning to the fourth annual report of the Gas Council covering the year ended March 31 we find that the gas industry's sales of sulphate of ammonia amounted to 81,100 tons, or a little more than 1,000 tons above the sales for 1951-52.

The bulk of the supplies accumulated on British farms in 1949-51 had been consumed by the end of June, 1952, but producers of nitrogenous fertilisers were carrying heavy stocks on their works on July 1, 1952, when all fertiliser prices were reduced. Rumours of further price concessions made buyers reluctant to place forward orders, and there was little confidence in the market. The reduction in the price of sulphate of ammonia by 8s. a ton, coupled with the Government's decision to pay a subsidy equivalent to £3 3s. per ton of sulphate of ammonia direct to farmers, gave a fillip to the home markets. Several favourable events, culminating in the Prime Minister's speech to the National Farmers' Union last January, helped to convince farmers that the Government would support home food production by practical and substantial means. This was emphasised by the prompt action taken to help farmers who suffered in the East Coast floods just under a year ago. Following the floods, which put thousands of acres of land out of production, the dry weather in February and March proved almost ideal for spring cultivations and sowings, and the extra yields from undamaged land more than made up for the losses due to the floods. Restored confidence and the favourable weather brought an overwhelming demand for fertilisers of all kinds, and record deliveries were made.

Exports of sulphate of ammonia from the United

Kingdom during 1952-53 totalled 455,577 tons and showed an increase of no less than 31% over the high figure achieved in the previous year. Among the most notable increases in exports were those to China and Hong Kong, which rose from 34,934 tons to 109,942 tons; other Asia countries (28,056 tons against 1,605 tons in the previous year); and the United States (12,858 tons against a mere 60 tons in 1951-52). In view of the considerable accumulation of stock the departments concerned with the control of exports were able to grant licences more freely than in previous years. Mr. F. C. O. Speyer, C.B.E., continues to fill the office of Chairman, with Mr. Michael Milne-Watson (Chairman of the North Thames Gas Board) and Mr. Lawrence Weaver as Vice-Chairmen. The area boards are well represented on the council and committees of the Federation by Mr. W. S. Johnston (Scottish), Mr. E. Crowther (Northern), Mr. W. Hodkinson (North Western), Mr. E. H. Harman (East Midlands), Mr. W. K. Hutchison (South Eastern), and Mr. J. H. Dyde (Eastern).

Experiments continued during 1953 with the direct use of ammoniacal liquor as a fertiliser, and reports from Lincolnshire showed satisfactory results over a five-year period. From experiments on root vegetables conducted by the North Eastern Gas Board in co-operation with the West Yorkshire Agricultural Executive Committee the conclusion was reached that the small difference between the yield from land treated with sulphate and that from land treated with gas liquor could be ignored for all practical purposes. During the year ended March 31 this year the Southern Gas Board sold 1,430,000 gal. of crude liquor for agricultural purposes, compared with 984,000 gal. in 1951-52, and 202,000 gal. in 1950-51.

'W.D.' JUBILEE

As the old year drew to its close we received from the Woodall-Duckham Construction Co., Ltd., a beautifully produced brochure marking the Jubilee of the Woodall-Duckham organisation. 'W.D.' came into being in 1903, when the original patent in connection with the Woodall-Duckham continuous vertical retort was taken out by Lieut.-Col. H. W. Woodall, C.I.E., and Arthur Duckham (later Sir Arthur Duckham, G.B.E., K.C.B.), and the commemorative book reviews 50 years of coal carbonisation. We shall make further reference to the brochure in a later issue.

JUVENILE LECTURE

Christmas past is a sad time for younger adolescents. During Christmas Day and the preceding period of animation they are treated with the respect usually reserved for adults. But when Christmas is a mere memory of spiritual and gastronomic satisfaction the unfortunate youngsters are left to kick their heels or run errands until the new school term commences. Once again, therefore, we are glad to record that the Institution of Gas Engineers has helped to alleviate this pale period for callow youth with its third Christmas lecture. On January 1, Mr. J. E. Davis, O.B.E., Chief Technical Officer of the South Eastern Gas Board, spoke to 250 young people at the Sir John Cass College, London, on 'The Movement of Gases.' His lecture was illustrated with experiments that captured his audience's imagination as much as any Christmas party could have done.

While Mr. Davis blew bubbles of different weights and released bags of hot air; made a snowstorm and poured gas from test tubes like water, there was no sign of cynicism on the children's faces. On the contrary Mr. Davis struck just the right balance of presentation. The boys and girls were not being treated like kids, but they could understand everything that went on. From simple but clever experiments, Mr. Davis passed to the movement of gas in industry.

If criticism is to be made: Mr. Davis's lecture would have been improved, we feel, with fewer films and slides. So fine was his presentation of propaganda for the gas industry that such hackneyed aids were almost unnecessary. One sensed, while the screen was being used, the audience's impatience. They had seen that sort of thing before. But Mr. Davis was a new experience. In fact, the industry won many hearts that day; an impression was made on a small section of an age group becoming increasingly hard to impress. Similar lectures under the ægis of the Institution of Gas Engineers are being held in some of the larger provincial cities and towns. One was at Bournemouth and more will be in Scotland.

Calendar & Directory

ALTERATIONS

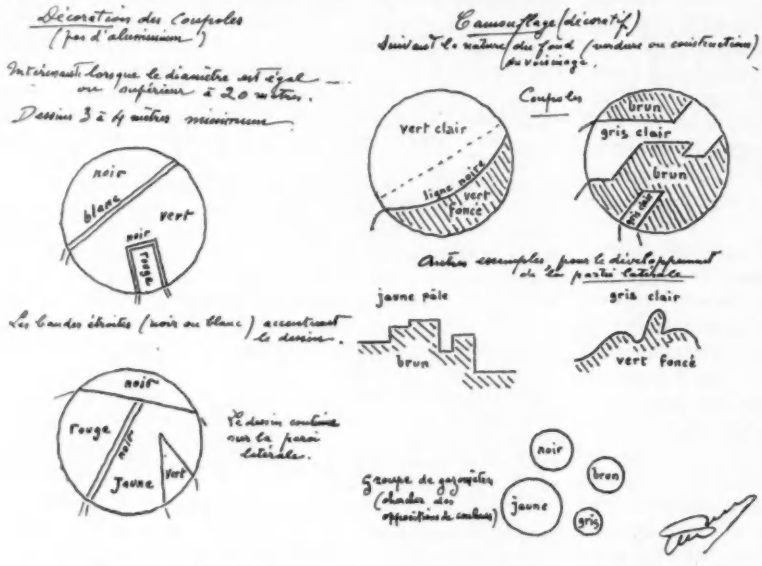
MOST of our subscribers have by now received their copies of the 1954 edition of the GAS JOURNAL CALENDAR AND DIRECTORY. Additional copies will shortly be available at the published price of 25s. including postage. In accordance with our usual custom we shall refer in the first issue of the JOURNAL in each month during 1954 to the latest changes affecting the data published in the DIRECTORY. The following alterations have been notified during December. To keep the information in the 1954 edition up to date readers are invited to note these changes, together with the appropriate adjustments relating thereto in the Personnel Section of the DIRECTORY (pp. 138-150).

Page 22.—NORTH THAMES GAS CONSULTATIVE COUNCIL: Address changed to Palace Chambers, Bridge Street, Westminster, S.W.1. T/N TRAfalgar 4773.
Page 54.—HORNSEY: J. F. Doran, *Local M.*; P. G. S. Fry, *Station E.*
Page 57.—NORTH WESTERN GAS BOARD: Add Dr. C. J. T. Cronshaw, *part-time Member.*
Pages 83 and 86.—KENT COUNTY DIVISION: Delete W. A. Barnett, *Div. Distributing E.* (deceased).
Page 91.—SOUTH WESTERN GAS BOARD: Delete E. K. Richmond, *Deputy S. and Solicitor.*
Pages 105 and 112.—PEMBROKESHIRE GROUP: D. W. Rees, M.B.E., *Deputy Chairman of the Group.*
Page 112.—PEMBROKE AND DISTRICT UNDERTAKING: Delete D. W. Rees, M.B.E., *E. and M.*
Page 111.—LLANELLY AND GOWERTON UNDERTAKINGS: D. W. Rees, M.B.E., *E. and M.*
Page 117.—WEST MIDLANDS GAS BOARD: Coke Manager's Address: 60, Hagley Road, Edgbaston, Birmingham, 16. T/N EDGbaston 3682.
Page 133.—AIRDRIE: T/N should read Airdrie 2464-5.
Page 133.—HAMILTON: Delete Wm. Scott, *District E.* (deceased).
Page 181.—WALES AND MONMOUTHSHIRE SECTION, I.G.E.: Address of J. Powdrill, *Hon. Secretary*, should read Cardiff.

Correspondence

PAINTING OF GASHOLDERS

DEAR SIR,—I thank you for your note enclosing M. Maurice Veillon's letter on the subject of the painting of gasholders. He says: I read in your issue No. 4720 of November 18 your report of the study in the æsthetics of our industry, and I thank you for your reference to my book, 'Notes d'Architecture Industrielle.'



I greatly admire the architecture of English gasworks and am interested in the new installations erected in your country.

I am continuing my studies of the camouflage and even decoration of gasholders. For it is no longer necessary to avoid this idea of 'decoration,' in spite of its audacity and the difficulties encountered in its realisation. The 'aerial æsthetic' of industrial structures should be studied, both from the point of view of urban amenity and from that of aviation. In our industry there is the problem of the gasholder. After much observation I have prepared models to respond economically to the two ideas, camouflage and decoration. And I enclose sketches from my notes which may prove of interest to our British colleagues.

I suggest, Sir, that you should, if space permits, reproduce M. Veillon's sketches just as they are.* The first shows suggestions for the decoration of the crown. 'Not aluminium.' Interesting, he says, when the diameter is equal to or more than 20 metres. The design is mainly black fading-off to green at the right with a narrow band of white and a curious patch of red. The narrow bands (black or white) accentuate the design.

One of the sketches indicates patches of black, red, yellow, and green—the design to continue on the sides of the lift in very large patches in different combinations. A further sketch is headed 'Camouflage (decorative) according to the nature of the background (green vegetation or buildings).' There are two designs for the crown, the left in light and dark green divided by black line, while the right-hand design is a combination of brown and light grey. Below are two suggestions for breaking the line of division of colours on the side, the left pale yellow above and brown below and the right light grey above and dark green below. At the bottom we have a group of holders each in a different colour, with the note 'the colours should be opposed.'

Well, Sir, it is clear that M. Veillon is thinking more of the aviator and his passengers than of the dwellers below. In his book is to be found a study of a particular holder in what we gather is a conspicuous situation at Chartres. It is a 8,000 cu. m. holder (say, 280,000 cu.ft.) 30 m. high and 24 m. diameter—not very big. He studied its appearance from several viewpoints in and about the town. He proposed to paint the upper portion in very pale grey and the rest in 'tar,' the results being best attained by the use of an aluminium bituminous paint. This study is followed by a wonderful selection of designs in stripes and patches.

All this is very interesting; but it is doubtful whether English gas engineers and town planners will be much impressed. On the one hand they are too much engrained with the modern aversion (in which M. Veillon himself concurs) against meretricious ornament. And on the other there is, at any rate on the side sheets of the lower lifts, the problem of the contamination, by water and/or oil, of the paint applied to a water-sealed holder, a problem recently dealt with in Mr. Ravald's fine report presented to the autumn meeting of the Institution of Gas Engineers.

No, Sir, I think we must hesitate to accept M. Veillon's invitation to go into the decoration of the gasholder, and we must be thankful if, by the use of suitable combinations of light and dark shades of greys or browns, we can render the 'hallmark of the gas industry' a little less conspicuous.

Yours faithfully,

ASHTON.

January 2, 1954.

* *The sketches are reproduced with this letter.*

INTERCHANGEABILITY OF GASES

DEAR SIR,—I was surprised to note in your recent editorial on Gas in America (GAS JOURNAL, vol. 275, No. 4712, page 764, September 23, 1953) the interest in the problem of interchangeability of alternative gases. The Bureau of Mines under a co-operative agreement with the American Gas Association has been investigating the fundamental combustion characteristics of fuel gases and the exchangeability of such gases in the distribution lines of gas utilities. Our approach has been to gain understanding of the basic physicochemical factors involved in the behaviour of fuels on gas burners. In this respect our work should be of interest to many groups in the gas industry abroad. A number of publications have been issued and are listed in the accompanying bibliography. Considerable further work is to be reported in subsequent publications.

Yours faithfully,

JOSEPH GRUMER,
Acting Chief, Flame Research Section.
Bureau of Mines,
Pittsburgh 13, Pennsylvania.
December 18, 1953.

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COMPLETE GASIFICATION

DEAR SIR,—I read with interest the editorial on complete gasification, with special reference to the WD/IFE plant, in your issue of December 16, 1953, but I am surprised that you consider this to be a completely new development. This type of plant, which consists, essentially, of a retort superimposed over a water gas generator, has been known and has been in practical operation in this country for very many years. You say, 'it is indeed this question of flexibility in gas manufacture which above all marks this new development . . .' The Company with which I am associated has for very many years emphasised the flexibility of the low-pressure complete gasification process.

As long ago as 1898 the late C. B. Tully, in conjunction with V. B. Lewes, developed a plant for the enrichment of water gas with methane derived from the cracking of fuel oil on the incandescent fuel bed of a water gas generator. This plant was known as a methane-hydrogen plant. While it was found possible to obtain a satisfactory gas, the cost of the oil was too great for the purpose. In view of the fact that tar was at that time a waste product, this was used instead of oil. The generator was slightly modified and the process was patented in 1901. Subsequently the plant was modified so that the waste blow gas passed up flues surrounding the upper part of the fuel bed, thereby heating what was in effect a superimposed retort. As a result of the development of the use of tar for other purposes, the plant underwent further modifications so that either coal or coke could be preheated prior to undergoing the water gas reaction. Other modifications were completed, consisting mainly of methods for cracking the tar vapours.

About the same period various designs of low-pressure complete gasification plants were made. Most of these, however, fell by the wayside, mainly due to lack of financial support. The Tully Company, however, persisted with its efforts and has in fact been building plants continuously since 1919. In the period immediately following 1919 there was a serious shortage of carbonising plant. A number of emergency, low priced, Tully coal gasification plants were installed to meet the gap. These plants were of a very simple type designed specifically to meet the immediate necessity. At a later date the original purpose of these plants was overlooked. Although C. B. Tully and others pointed out to the Institution of Gas Engineers from time to time that the then existing coal supply position would not be maintained for ever, complete gasification was not generally popular with gas engineers. The Tully Company was, therefore, forced into the production of a type of complete gasification plant of low capital cost which in most cases had to be competitive with blue water gas plant instead of being considered in its true perspective as a base load plant. A few undertakings did install Tully complete gasification plants as base load plants and distributed a gas of approximately 340 B.Th.U. with considerable success and financial advantage. However, the advocates of so-called low C.V. gas were an enthusiastic minority, and the larger works maintained a policy and economy based on dual coke and gas sales. In the meantime an oil carburetted Tully complete gasification plant had been developed for those who demanded a higher calorific value.

Immediately following the second World War, a number of larger Tully plants of improved design were ordered and put into operation. Details of the starting-up of some of these newer plants have been reported in your columns from time to time.

You will doubtless be interested to note that in the Fife area of Scotland only weakly-swelling coals have been available; and in this area Tully complete gasification plants have been extremely popular and successful over very many years. The following is a list of Tully complete gasification plants at present in actual operation in this area (the number of units and the year of installation are also given).

Anstruther	..	Two	1932 and 1936
Cowdenbeath	..	Three	1935 and 1950
Kelty	..	Two	1930 and 1944
Kennoway	..	Two	1946 and 1950
Kirkcaldy	..	Two	1949 and one under construction
Leslie	..	Two	1930 and one under construction
Markinch	..	Two	1920 and 1943
St. Andrews	..	One	1945

The results being obtained from these plants, considering the type, size, and method of operation, compare favourably with the 190 therms per ton on a dry ash-free basis, and the calorific value of 335 B.Th.U. reported for the G.I. plants.

You may also be interested to know that various technical improvements have been made to a new Tully low-pressure complete gasification plant recently completed, and that detailed results from this modified process will be available shortly.

Yours faithfully,
Tully, Sons & Co., Ltd.,
J. E. TULLY,
Director.

January 1, 1954.
Newark, Notts.

GAS COUNCIL & S.B.G.I.

Joint Consultative Committee

Seated (left to right): R. J. Rogers, Chairman, S.B.G.I., S. G. Aberdein, Chairman, Commercial Managers' Committee, Mrs. Eileen Murphy, Secretary, Commercial Managers' Committee, A. F. Oatley, S.B.G.I. representative. Standing (left to right): G. C. Holliday, Manager, Watson House, S. A. King, Commercial Managers' Committee, J. W. Rodgers, Commercial Managers' Committee, R. Knight, Chairman, S.B.G.I., M.W. Burt, Director and Secretary, S.B.G.I., V. W. Stanton, Commercial Managers' Committee, W. F. Andrews, Chairman, S.B.G.I., and R. J. Gregg, Publicity Manager, Gas Council.

Personal Notes

NEW YEAR HONOURS

The list of New Year Honours published on Friday included a Barony for the Right Hon. RICHARD K. LAW, a Director of Ascot Gas Water Heaters, Ltd., who presented a paper at the 1952 Gas Salesmen's Conference. Among the new Knights is Mr. OLIVER LYLE, O.B.E., who has received the honour in recognition of services in promoting fuel efficiency.

Mr. W. K. HUTCHISON, Chairman of the South Eastern Gas Board, receives the C.B.E.

Mr. D. D. BURNS, Deputy Chairman of the Scottish Gas Board, receives the O.B.E., as also do Mrs. F. H. CANTWELL, J.P., Chairman of the Domestic Coal Consumers Council, and Mr. ARNOLD MARSH, Director of the National Smoke Abatement Society.

Mr. W. J. BAKER, Divisional Manager, Northern Division, South Western Gas Board; and Mr. FRANK BOARDMAN, who recently retired from the position of Engineer and Manager of the Cardiff undertaking of the Wales Gas Board, are among the new holders of the M.B.E.

Several employees of the gas industry are recipients of the British Empire Medal (Civil Division). They include: S. ASKEW, Installations Inspector, Stretford (North Western Gas Board); J. F. BONNET, lately district fitter foreman, Lea Bridge (North Thames); C. W. GASCOIGNE, district inspector, Sheffield (East Midlands); S. S. HOPKINS, assistant supervisor, Edinburgh (Scottish); F. JOHNSON, district inspector, Scarborough (North Eastern); F. A. T. SEWELL, general works foreman, Flathouse Works, Portsmouth (Southern); T. W. SUMNER, senior and general foreman, Redheugh Works, Gateshead-upon-Tyne (Northern); and J. A. WHITE, mechanical engineer, East Greenwich (South Eastern).

* * *

MR. GEORGE W. P. PAGE, A.C.G.I., A.M.I.E.E., has retired from the staff of the Publicity Department of the British Thomson-Houston Co., Ltd., Rugby. Mr. Page joined the company in 1923, having previously held editorial appointments on *Electrical Engineering* and in the G.E.C. publicity department. His chief responsibility has been the preparation of articles for the Press and, as press liaison officer, has a wide circle of friends in both the technical and the lay press, who join in best wishes for a happy retirement at Broadstairs.

MR. H. MOYS, B.SC., has been appointed Chief Engineer to the West Midlands Gas Board. Mr. Moys is the third generation of his family to be interested in gas manufacture. After receiving his education at the Mercers' School, London, and King's College, London, he joined the Croydon Gas Company in 1931, serving first as an articled pupil engineer and later as a junior assistant. A period with the Commercial Gas Company followed, and in 1942 Mr. Moys moved to Liverpool Gas Company, becoming Assistant Engineer and then Deputy Gas Engineer. Subsequently he was appointed Deputy Production Engineer to the Liverpool Group of Undertakings of the North Western Gas Board. In June, 1951, he joined the West Midlands Gas Board as Production Engineer and his new appointment will also include the duties attached to that post.

MR. S. N. P. NELSON, Distribution Engineer to the Hartlepools and Peterlee units in the Stockton Division of the Northern Gas Board, has been appointed Assistant Distribution Engineer (Mains), North Wales.

MR. J. G. RENTON will represent the Parkinson Stove Co., Ltd., in the Southern Gas Board area and the Channel Islands. This territory was previously covered by Messrs. Whimster, Ogden, and the late T. B. Armitage. MR. T. C. WHIMSTER will be South Eastern Area Manager, and MR. C. A. OGDEN will act in a like capacity in the Eastern Gas Board area, both operating from Terminal House, Grosvenor Gardens, S.W.1, where Mr. C. T. C. Woodall is London Manager. Mr. Ogden will also continue to represent the company in the Lincolnshire Division (East Midlands). MR. S. A. WARD, who was assistant to Mr. T. B. Armitage, until the latter's death, will be responsible for the South Western area.

* * *

WALTER KING LTD.

Midlands Manager

MR. G. B. TORRANCE has been appointed Midlands Manager to Walter King, Ltd., publishers of the 'GAS JOURNAL' and 'GAS SERVICE.' He succeeds Mr. MOSS, who has retired.

A Scot, born in Motherwell, Mr. Torrance was in employment with the Burgh Council when war broke out. Joining the Fleet Air Arm in 1940 he served with the Royal Navy for seven years in various theatres of war, reaching the rank of Lieutenant. On demobilisation in 1947, he joined Walter King, Ltd., and has had experience of all branches of a publisher's work. Four months ago he and his family moved to 42, Wychall Lane, King's Norton, Birmingham 30, which is now the Midland Office of the firm.

Obituary

MR. J. ROSE, formerly Manager at Bourne, Lincs., died in Peterborough Hospital on January 3, aged 62. Born at Sleaford, he was apprenticed there as a gas engineer, and afterwards went to Harpenden, Sunderland, and Uttoxeter. After serving in the 1914-18 war in which he won the D.C.M., he returned to Uttoxeter for a short time before being appointed Manager at Bourne 31 years ago. He retired about a year ago.

THE LATE J. W. NAPIER

MR. W. J. SMITH writes: When John Watson Napier, M.B.E., retired to Perthshire some years ago a room in the house was devoted to photographs of personalities in the gas industry who had influenced his life and of those with whom he had ties of friendship. Among the notable people were: Thomas Newbigging, Sir Arthur Duckham, Sir Ernest Smith, Sir Wm. White (Lanark), A. Yuill (Dundee), G. R. Hislop (Paisley), G. P. Mitchell (Worcester), James Campbell (Dunfermline), A. W. Smith (Birmingham). He never tired of commenting on the virtues of these and other friends in the industry. Mr. Napier's influence was largely responsible for the formation of the Scottish Gas Council on the constitution of which the National Gas Council was subsequently based.

He was justly proud of his works at Alloa, where he introduced efficient and up-to-date Woodall Duckham vertical retorts. He was also possibly the originator of the planting of trees and grass sward adjacent to the works. This last innovation, which has now been adopted in many other instances, gives the key to Mr. Napier's outlook—not utility only but beauty must be pursued. One of the striking features in his home was his collection of pictures, and perhaps the most outstanding was a matchless example of a painting by Hornel depicting children among wild flowers against the water's edge. Standing in the hall was a bronze statue of Robert Louis Stevenson. He was a member of the Stevenson Society of Edinburgh.

Mr. Napier was very proud of his country, and to those who were interested in its history he was a lavish and indefatigable guide. Those friends who were present in Edinburgh when Mr. Napier was presented with his portrait in oils by Cowan Dobson will never forget the deep impression made by this wonderful picture. The beautiful and perfect likeness will endure as the memorial to a remarkable man.

Diary

Jan. 9.—SCOTTISH JUNIORS (EASTERN): Short Paper Day at Dundee.

Jan. 9.—YORKSHIRE JUNIORS: 'The Training of Main and Service Layers,' R. H. O'Neill, Distribution Engineer, Huddersfield/Halifax Group, North Eastern Gas Board. Stratford Arms Hotel, Wakefield, 2.30 p.m.

Jan. 14.—MANCHESTER JUNIORS: Short Papers for the 'F. Johnstone' Prize.

Jan. 15.—SCOTTISH JUNIORS (WESTERN): 'Some Aspects of Consumer Service,' W. A. Green, Paisley.

Jan. 15.—LONDON JUNIORS: 'Gas to Crawley and other Distribution Problems in New Towns,' J. E. Steele, South Eastern Gas Board.

Jan. 18.—EASTERN G.C.C.: Connaught Rooms, Great Queen Street, Kingsway, W.C.2.

Jan. 19.—LONDON AND SOUTHERN SECTION, I.G.E.: 'Steam and Power at Bow Common,' A. F. Grant, North Thames Gas Board.

Jan. 20.—YORKSHIRE JUNIORS: 'Review of Town Gas Production,' A. F. Cottrell and T. W. Austen, Woodall-Duckham Construction Co., Ltd. At Bridge Street, Leeds.

Jan. 20-29.—HOTEL RESTAURANT AND CATERING EXHIBITION, Olympia. Gas Council Exhibit.

Jan. 27.—EASTERN JUNIORS: 'Distribution Problems,' R. O. Emmony, at Hitchin.

Jan. 28.—MIDLAND JUNIOR GAS ASSOCIATION: Visit to Parkinson Stove Co., Ltd.

Jan. 29.—SCOTTISH JUNIORS (WESTERN): Annual Dance and Buffet. The Ca'doro, Union Street, Glasgow. 7.30 p.m.

Jan. 30.—MANCHESTER JUNIORS: Visit to Blackburn Greenbank Gasworks. 'The Design and Performance of 0.5 mill. cu.ft./day Tully Carburetted Complete Gasification Plant.' G. R. Spence and G. Wheatman, Kendal Group.

Feb. 1.—WEST MIDLAND G.C.C.: Queen's Hotel, New Street Station, Birmingham. 2.15 p.m.

W-D in 1953 were "on site" building 44 NEW COAL CARBONISING PLANTS with an annual coal carbonising capacity of 6½ million tons.

AS MAKING PLANTS

	Tons coal/day
√ Bilston III	86
Boston	96
√ Brighton I	406
Brighton II	406
Brighton III	406
Croydon IV	270
√ Derby I	380
Derby II	380
Derby III	380
Dover I	341
Dunfermline II	40
Edinburgh IV	259
Edinburgh V	259
Exeter	377
Glasgow Tradeston II	179
Greenock II	99
Grimsby VI	80
Irvine III	18
Jersey	190
√ Kensal Green V	336
√ Lincoln IV	138
√ Penzance III	42
Rotherham	617
Smethwick III	205
√ Strandvej, Denmark V	50
√ Swan Village II	576
√ Tingley I	511
Tingley II	511
Tipton II	45
Tottenham V	557
Walsall II	821

√ *Completed and put to work.*

The figures following the contract names denote the number of installations built at this Works.

OKE OVENS

	Tons coal/day
Avenue, Chesterfield	2175
Beckton IV	603
Cardiff IV	963
√ Corby V	371
Ebbw Vale IV	444
Fishburn, Durham	1000
√ Irlam III	390
Lysaght IV	490
√ Monckton, Barnsley III	218
Moss Bay, Workington III	1159
Orgreave III	858
Redbourn II	353
Stanton II	918

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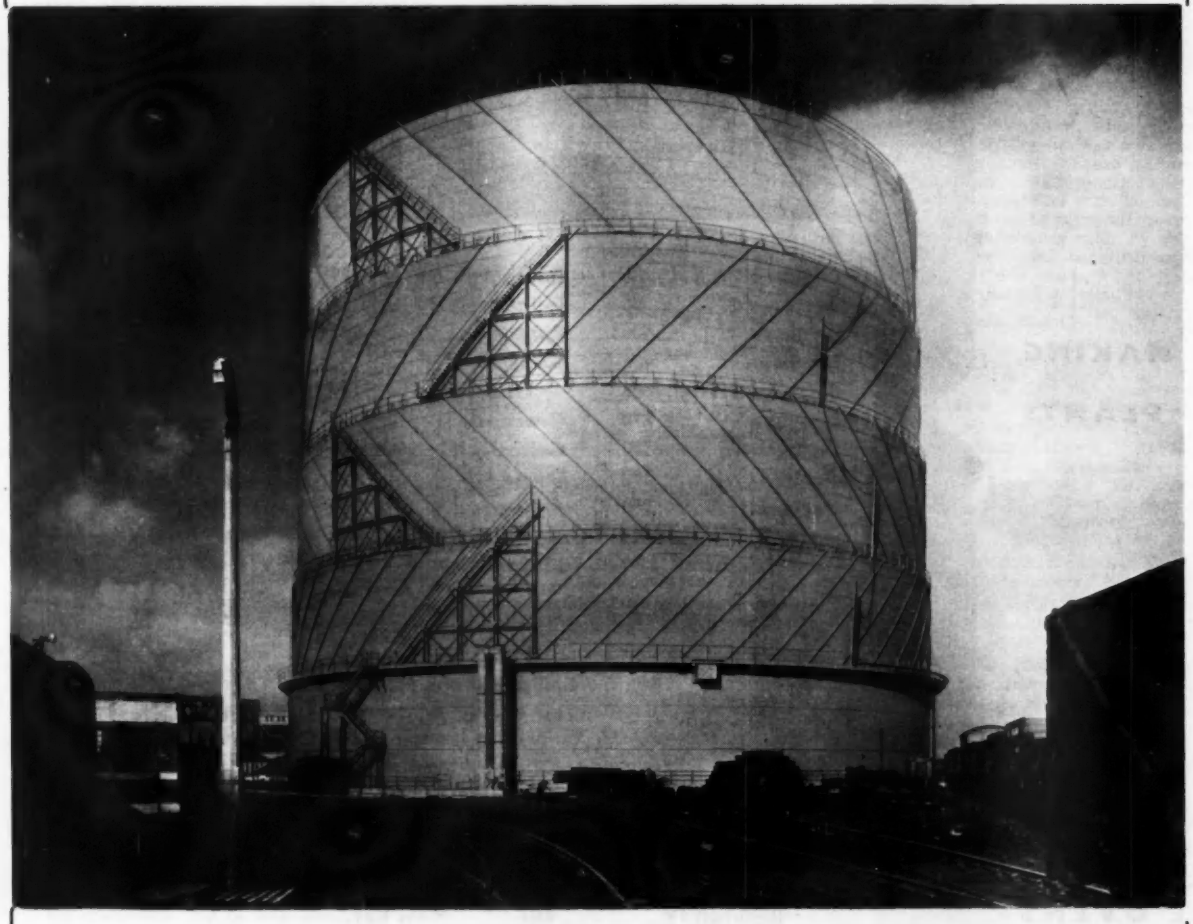

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A GAIN TOWARDS FLEXIBILITY

GASIFICATION OF OIL—CATALYTIC AND OTHERWISE

SEGAS AND H. & G.

At the start of the New Year we present two pictures of the 'black market' in oil. One of them is a result of our inspection of a catalytic plant at one of the works of the South Eastern Gas Board, the other from a visit to one of the works of the West Midlands Gas Board.

In point of fact there is nothing mysterious about this black magic, which from time to time has given fillip to meetings of gas consultative councils and has proved impressive in the confidential talks of high-ups in the nationalised gas hierarchy. In basic tongue there is the SEGAS catalytic system of making town gas from 'heavy' oil. Of foreign origin in regard to catalysts is the ONIA-GEGI (Licencees, Humphreys & Glasgow, Ltd.) process which was fully described in the 'GAS JOURNAL' *of September 23, 1953. The Power-Gas Corporation, Ltd., is interested in the SEGAS system. Both these eminent firms in the gas industry are also concerned in the outcome of the non-catalytic cracking of 'heavy' oil in water gas plant for the manufacture of town gas. The Minister of Fuel and Power, Mr. Geoffrey Lloyd, has inspected these plants and has shown keen appreciation of the development taking place in the black district around Birmingham and in the low country near Catford Bridge. In both areas catalytic and non-catalytic work proceeds rapidly, and important data are steadily being accumulated.*

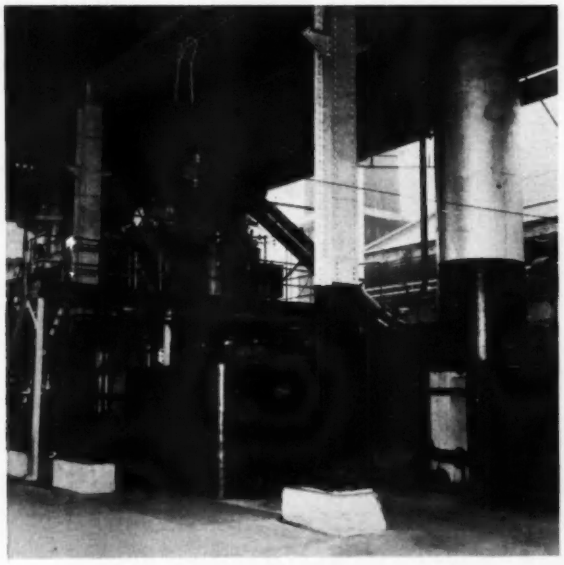
Regarding the Minister's tours we are not chronologically exact in relating first his visit to the Sydenham Works of the South Eastern Gas Board. His first inspection was in fact, and wisely, in the precincts of his own constituency, of the black-oil plants at Saltley and Solihull, West Midlands Gas Board; but that was less official than his visit to Sydenham, when he was accompanied by Sir Harold Smith, Chairman of the Gas Council, and the Chairman and Deputy Chairman of the S.E.G.B., Mr. W. K. Hutchison and Mr. R. S. Johnson. This was a considerable occasion; and the Minister took the opportunity of offering his congratulations to both Boards on their pioneering endeavours to mitigate the 'chronic shortage of gas-making coals,' the while using to good advantage the residue of the oil refineries.

THE SEGAS OIL PLANT

First, then, our impressions of our visit to Sydenham. The magnitude of the programme of shipping crude oil to the industrial centres of the world, and there refining it, is common knowledge. In the huge refineries already in operation in the United Kingdom spirits and oils are produced within the market for them, and there remains a substantial quantity of heavy oil. In 1950, at the research meeting of the Institution of Gas Engineers, Messrs. H. Stanier and J. B. McKean described work which foreshadowed the possibility, in simple plant, of producing well over one therm per gal. of 500 B.Th.U. gas having characteristics similar to those of normal town gas, using as raw material heavy petroleum fractions. The work was started by the South Metropolitan Gas Company and has been continued since nationalisation by the South Eastern Gas Board. The South Met. took the experiments as far as the first pilot plant stage, and after

The Minister of Fuel and Power visits the Sydenham Works. Left to right: Mr. R. S. Johnson, M.B.E. *(Deputy Chairman, S.E.G.B.), Mr. Geoffrey Lloyd, Mr. W. K. Hutchison (Chairman, S.E.G.B.), Sir Harold Smith,* K.B.E. *(Chairman, Gas Council), Mr. H. F. H. Jones,* M.B.E. *(Deputy Chairman, Gas Council), Mr. J. E. Davis,* O.B.E. *(Chief Technical Officer, S.E.G.B.).*

1949 the Board encouraged the work to proceed at an accelerated pace. A first large-scale unit was erected at the Old Kent Road works and served to indicate the type of practical problems which would be encountered in bringing the laboratory process to full operating scale.



General view showing gas clearing plant with tar-making vessels in background.

The pilot plant was designed using as catalyst a mixture of bauxite, calcium carbonate, and bentonite. The plant was of sizeable dimensions and the results with heavy oils were most encouraging. The thermal efficiency of the process reached 60%, and it was anticipated that this would be improved to 70% or more in a large commercial plant, and that in such a plant it would be possible to make the process self-supporting in heat and power requirements.

Power-Gas Corporation Co-opted

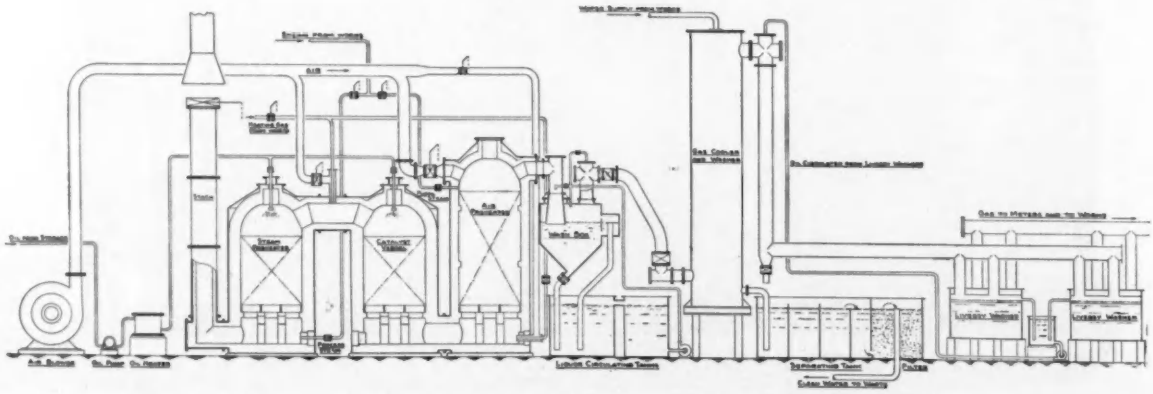
An agreement was entered into with the Power-Gas Corporation, Ltd., of Stockton-on-Tees, whereby their practical experience in the design of gas-making plant was added to the knowledge available of the new process. A prototype commercial plant was designed jointly and was installed at Sydenham, where it first started gas-making in February, 1953. Experience was gained in the operation of the plant and the control of the process, and gradually during the past year the plant has been brought up to its present performance. It is now producing 800,000 cu.ft. a day of a gas of standard quality and saving 60 tons of coal a day.

The plant consists of three cylindrical steel vessels lined with firebrick. In the first of these steam is raised to a high temperature by passage over heated refractory. This steam then meets a spray of oil, and the mixture of oil and steam passes over the catalyst in the second vessel where reaction takes place. After this the hot gas passes over brickwork in the third vessel, heating the brickwork, and becoming cooled in so doing. This flow continues for a few minutes during which heat is being absorbed and temperatures are falling in the steam preheater and catalyst bed. The steam and oil are then shut off, the gas offtake valve is closed, and air is blown backwards through the plant, becoming preheated in the third vessel and burning-off carbon from the catalyst and brickwork in the second and first vessels. An automatic operator opens and closes the controlling valves in the necessary sequence.

View of reaction vessels, showing, from left to right, steam preheater, catalyst vessel, and air preheater.

The following figures relate to the performance of the plant.

Size of vessels	Steam preheater	8ft. 6in. dia.	16ft. 6in. high
Overall external dimensions	Catalyst vessel	8ft. 6in. dia.	16ft. 6in. high
	Air preheater	7ft. 9in. dia.	21ft. 6in. high
Oil used	gal. per hour	130	
Steam used	lb. per hour	2,600	
Air used	lb. per hour	9,500	
Gas made per gal. of oil	1.15 therms		
Calorific value of gas	480-508 B.Th.U. per cu. ft.		



Diagramatic Arrangement of the ' Segas ' Oil Gas Plant at Sydenham

THE H. & G. SALTLEY PLANT

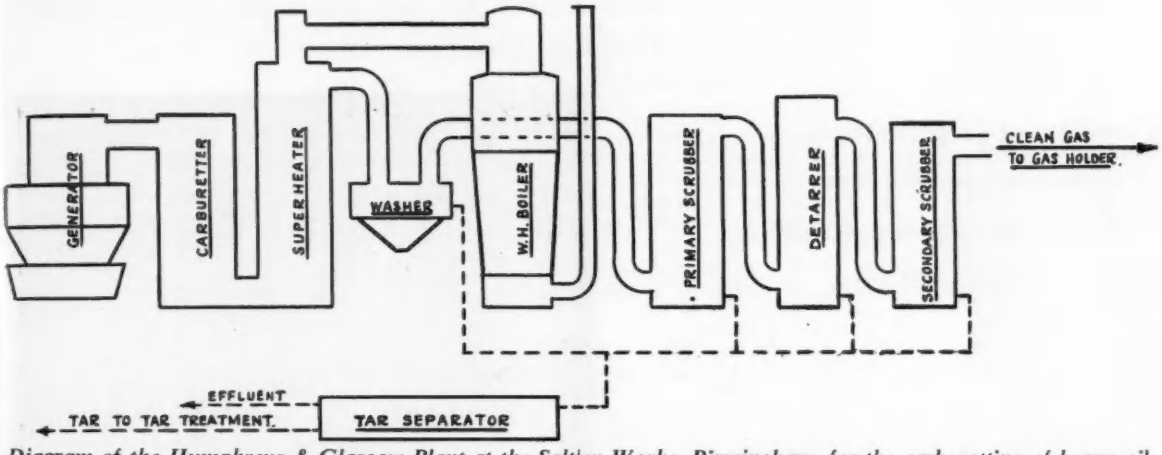


Diagram of the Humphreys & Glasgow Plant at the Saltley Works, Birmingham, for the carburetting of heavy oil.

We turn now to the new Humphreys-Glasgow heavy oil gasification process which we inspected at the Saltley works of the West Midlands Gas Board. Here the installation is a Humphreys-Glasgow fully automatic carburetted water gas plant making about 2,500,000 cu.ft. per day. It has been modified by the makers to incorporate their new heavy oil gasification process which has a number of most interesting features. The plant uses oil of widely varying characteristics and has the great advantage that the necessity for periodical interruption of the gas-making process for the manual removal of carbon deposits is eliminated.

The chief feature of the new heavy oil process is the carburettor, which is of entirely new design, and is described by the makers as their 'self-cleaning carburettor.' Unlike other heavy oil carburettors which are invariably empty, it contains the usual type of chequerwork on to which the heavy oil is sprayed, thereby ensuring maximum efficiency in oil gasification.

The carbon from the heavy oil, which is deposited on the chequerwork during the gas-making phase, is combusted during each operating cycle by the admission to the carburettor of a separate stream of preheated air. The products are utilised to generate waste heat steam. The preheating of the carbon-burning air is effected by special provisions within the carburetted water gas plant. The operating cycle, which is entirely automatic, differs from the normal gas oil cycle in that at the conclusion of the blow phase the secondary or carbon-burning air is continued for a short period.

To provide for the use of heavy oil of very low quality or for the production of gas of high calorific value, which in either case requires additional oil usage, Humphreys & Glasgow have provided for supplementary heavy oil to be gasified in the generator. Equipment is included for the heating of the top of the fuel bed and a special type of oil sprayer is employed to distribute the oil over its surface.

We were told that the plant has already gasified over 1,200 tons of heavy oil of widely varying characteristics including viscosities ranging from 500 to 1,000 seconds and Conradson carbon up to 10.5% in the production of carburetted water gas of a quality up to 500 B.Th.U. per cu.ft.

The use of heavy oil in carburetted water gas manufacture gives rise to the formation of tar emulsions during the gas cooling stages, and unless complete removal is achieved, difficulties may arise as a result of their subsequent deposition in gas mains and other parts of the system. Special ancillary equipment has been developed by Humphreys & Glasgow to deal with this situation, and in particular hot electrostatic detarring is employed. As a result the tar is deposited, leaving a substantially tar-free gas to go forward for final cooling before passing to the relief gasholder. The layout of the carburetted water gas plant and ancillaries is shown in the accompanying diagram.

The handling of tar emulsions, the formation of which is inevitable when using heavy oil, presents no difficulty. Dehydration is effected by indirect steam heating.

Both at Sydenham and at Saltley we were given every facility for inspecting the most interesting and important installations. To mention individual names would be out of place. On the other hand it would be churlish if we failed to record our thanks to all concerned who made our visits so scientifically profitable and intellectually stimulating.

LEA BRIDGE LINKED TO GAS GRID

A SPECIALLY-DESIGNED tubular bridge now carries a 24-in. main across the River Lea to link Lea Bridge to the North Thames gas grid system. Until this new link was brought into operation the district depended entirely on the works at Lea Bridge Road for its gas. Bearing in mind the rapidly increasing demand for gas in this area, the advantages of incorporation into the grid are obvious.

By means of the grid system the 8,800 miles of main throughout the Board's area are interlinked. Gas from 22 manufacturing stations (with the exception of Ascot, which will shortly be brought in too) can be 'pooled' for general use over the 1,000 sq. miles served by the North Thames Board.

The great value of such a system was strikingly demonstrated earlier this year, when the East Coast floods put Southend works out of action for some hours and gas was boosted to the flood-stricken area through the South Essex link of the grid.

This is the second time the Board has specially bridged a river to carry a gas main over it. The other example, also over the Lea, is at Canning Town, where two 48-in. mains come westwards out of Beckton to London. There are many other places were a large main crosses a river, but it is usually carried in or attached to an existing bridge—or it may be self-supporting if the span is short.

The new bridge has a span of just over 140 ft. The design of the structure and the supervision of its erection were effected by close collaboration between the Chief Engineer's and Distribution Departments. Incidentally, the work involved negotiations with four local authorities, two public bodies, and one private company.

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COKE EFFICIENCY

FROM A PAPER TO THE NORTH WESTERN GAS BOARD SALESMEN'S CIRCLE, NOVEMBER 25, 1953, BY

J. WATERHOUSE,
M.Inst.F., Group Coke Sales Officer, Liverpool.

EFFICIENT combustion cannot be obtained from a solid fuel simply by installing any type of mechanical stoker. These machines may ensure a uniform supply of fuel; but while they can be automatically controlled from pressure, temperature, or flow regulators, they must have supervision. The economies effected by the adoption of mechanical stoking as against hand firing depend on conditions which vary for each installation. On very small plants it is necessary to determine whether mechanical stoking is an economical proposition.

For all but the very smallest of central heating plants there are manufactured and marketed today automatic coke stokers, usually called burners, complete with water-jacketed furnaces, giving higher efficiencies than any type of mechanical stoker. The size for these 'coke burners' ranges from 240,000 B.Th.U. per hour to 2 mill., and claims of 80% efficiency have been established, with a constant CO_2 flue gas of more than 16%, when using coke.

The new types of automatic stoker, two of which can be mentioned by name, Copperad and Suké, are the coke answer to automatic stoking. These burners can be attached to ordinary central heating plants without any alteration to the boiler itself. They are attached to the front of the boiler, coupled up to the furnace door for transmission of heat, and to the boiler for water circulation. They are both self-contained units and provide automatic firing combined with maximum possible thermal efficiency for low temperature hot water or steam.

The units consist essentially of the following parts: A water-jacketed combustion chamber; fuel storage hopper for automatic fuel feed, fitted with an airtight lid; fan for primary and secondary air conrol; air damper for combustion regulation; and thermostat for automatic temperature control of water flow and return, or pressurestat, as the case may be.

Reducing Heat Losses

An efficiency of 80%, as previously stated, is normally obtained due to vernier control of air supply resulting in high CO_2. Notable features are fuel and clinker handling once or twice per shift, according to load, and minimum of maintenance, as the gravity feed ensures minimum abrasive action. A water-jacketed combustion chamber gives efficiency and long life, and automatically extra heating surface. It protects the air inlets to the firebed and is shaped to allow the fuel to enter on both sides along the full length of the bed. This gives even burning and the formation of one single piece of clinker which does not adhere to the water-cooled surface but comes away whole. The combustion zone is completely enclosed by this water jacket, which is directly connected to the boiler circuit, thus reducing to a minimum heating losses from radiation.

Air reaches the fire through separately controlled primary and secondary inlets, thus securing complete combustion. This air is supplied from a forced draught fan which is controlled by the pressurestat or thermostat. The water (or pressure) controls the fan, and thus we have a cycle of control complete and automatic, and the unit can be left for hours unattended. This burner produces a perfectly burning flame operating at a very high thermal efficiency with coke, and gives excellent results. As these furnaces are cheaper than, or at the very most cost only the equivalent of, any of the ordinary types of mechanical stoker—output for output—and their efficiency, due to controlled, air, etc., is so high, they represent a most excellent proposition for use with coke.

There are no costly design of boiler or boiler house, no interference with normal operation, and no moving parts. There is absence of vibration, the fan being the only possible mechanical moving part to break down. There is positive draught control to maintain ideal combustion conditions in the burner. Space occupied is a minimum; overhead bunkers can be provided if necessary; the initial cost is normal; and virtually no replacements or maintenance are necessary. It is claimed that the initial cost of these plants can be saved in two seasons by anyone using 150 tons per season with the present price of coke as a basis.

All this sounds too good to be true—but it is true, and it is being proved daily. These 'burners' are made in sizes to cover a range of 240,000 to 2,000,000 B.Th.U. per hour, using coke, and their suitability for installation with any central heating plant, for schools, offices, factories, hospitals, public buildings, nurseries, etc., means that for all practical purposes there is now an ideal furnace, or burner, proved and on the market, eminently suitable for the efficient burning of coke.

Domestic Space Heating

We now realise that excess room ventilation is a major factor in determining the efficiency of any particular appliance. Ventilation should be restricted to about 600 cu.ft. of air per hour per person. Thus the amount of ventilation air required in a room occupied by four persons would be 2,400 cu.ft. per hour, but the air drawn through the room by the average open fire is in the region of 7,000 cu.ft. so that over 2½ times the amount of air is being passed through the room up the chimney. This excessive air is undesirable. It makes the room draughty, and carries off heat from the fire as it passes through the room on its way to the chimney. Secondly, the hot gases leaving the top of the fire are cooled by mixing with the rush of extra air, and it is difficult to extract much further heat from the cool mixture. So important is the case of open fires with unrestricted throats that it is not unusual for heating authorities to allow an additional 1,500 B.Th.U. per hour to compensate. This 1,500 B.Th.U. per hour corresponds to an extra air flow of, say, 3,700 cu.ft. of air per hour, raised 20°F. while passing through the room. It is usual to estimate a rise of some 20°F. to give average conditions of room comfort—always taking into consideration outside air temperature and surroundings. Among other things particular notice should be taken of glazed tiles, stone floors, and window air pressure across gaps in both doors and windows, which gives rise to heat losses.

Restricted Chimney Opening

Following on various bench tests, I recently decided to try out a restricted throat on my own coke-fired back boiler installation. The coke grate had been fitted many months previously, and had given every satisfaction with the exception of cold draughts through the room which increased with size and burning rate of the coke fire. The cross-sectional area of the opening to the chimney above the fire was found to be some 128 sq. in.—somewhat in excess of the recommended size.

The coal (stool) grate previously used was found, the coke fire removed, and the coal grate properly refitted. Specially screened bituminous coal 2 in. by 1 in. was obtained (of a quality much better than one can get from the merchants) and also a quantity of ordinary domestic coke, all carefully weighed—the coal into 12 lb. and coke into 8 lb. units, this to compensate for the higher bulk density of the coal—and stored in airtight tins. After the coal tests the coke fire was refitted, and I found out what happened when the hot gas passage under the back boiler was sealed off. The results proved that a correct gas passage of 1 in. under the back boiler is essential. With this flue sealed there was a loss in efficiency of heat transfer

to the water of 2.72% as compared with the test when the flue was free. This is equivalent to a reduction of 20.4%.

The results when burning coal showed a loss of efficiency of 3.27% as against the coke grate, and 2.90% for the normal domestic grate when compared with coke burned in a coke grate under the same conditions. With the chimney opening restricted to 36 sq. in., there was an increase in efficiency of 3.45%, equivalent to a gain of 25.8% on the corresponding test with the chimney unrestricted.

During all tests with the restricted chimney opening, there was a noticeable improvement in room conditions as regards draughts.

The restricted throat of 36 sq. in. has been further reduced to 10 sq. in. Room draughts have disappeared and hot water is certainly obtained in greater quantity.

With some fires the air supply, both for combustion and for satisfying the chimney pull, is drawn from outside the room, thus reducing the amount of heat taken away from the room, but this arrangement needs structural alterations. It is, however, the ideal way of supplying primary air without the cold draught.

Comfort Conditions

The rate of burning of the usual type of domestic fire is controlled by the use of the under-fire air damper. The better way to combat over-fire excess air into the chimney is to adopt the room heating stove, and restrict the throat of the chimney to a minimum. A correctly designed throat can work wonders on fuel economy, but it must be correctly designed to be really effective. If possible it should be adjustable to compensate for an unrestricted air passage when lighting-up the fire, reducing the area when the flue is warm. The old-fashioned adjustable canopy giving a restricted throat was a step in the right direction, but with the advent of tiled surrounds canopies have been abandoned due to appearances.

Room heat comfort depends not only on design and circumstances but also on the personal factor. If in a room one's feet are cold and head too hot, together with a general feeling of stuffiness and discomfort, it is largely due to the difference between floor and ceiling temperatures, caused usually by the air current being too low. The low-set coke grate with its high radiant heat output, discharged at low level with a correctly sized restricted throat, ensures maximum of room heat at the lowest air flow and gives the greatest efficiency with satisfactory comfort. Experiments show that it is possible with a coke fire to have a permanently restricted throat of only 7 sq. in., thus providing a greater draught on the flue side of the restriction—making the flue less likely to suffer from down-draught.

Many suggestions for improving the open fire have been made, but the chief wastage of fuel is caused by the useless heating of over-fire air. Approximately 10 lb. of air are required to consume completely 1 lb. of coke. An open fire often has 20 times this theoretical quantity. Provide good insulation lining to a fire, and use the heat around the sides and back, etc., to warm a current of air passed into the room (convection heating). Bring in the combustion air from outside direct to the hearth, preventing a great deal of across room draught. The fitting of an approved type of coke grate into an ordinary coal fireplace will raise the radiation some 10%; and if a well-designed throat is fitted, a further improvement can be obtained. It is, of course, necessary to have the chimney throat of a size to avoid excessive resistance to the flue gases, as the fire initially depends upon the chimney pull.

Much depends on the insulation of the premises and the general ventilation losses. House insulation efficiency is a governing factor and must be given due consideration. Test bench efficiencies give comparative data, but two similar appliances installed in different dwellings will obviously not produce the same results. All useful heat cannot easily be accounted-for, since with solid fuel fired appliances there is the advantage that a proportion of the heat output from the furnace will soak into various parts of the house remote from where the fire is installed. At the moment over 40% efficiency is often regarded as the upper limit for solid fuel heating, but a figure somewhere between 70% and 80% should be our object.

The tendency today is to use solid fuel during the winter for water heating, usually on the score of cost together with the fact that most people have a domestic fire in winter and use this with back boiler for water heating. Hot water consumed per household is generally the same in summer as in winter. Gas enters the market on the ground of quickness and adaptability. Generally speaking gas and coke are not in competition one with the other, but are complementary.

With present costs there is a leaning towards a policy of solid fuel for water heating all the year round, but this is affected by the difficulty that coal merchants have in meeting customers' coal demands. An opportunity lies here for 'piped' fuel—but the idea is gaining ground that solid fuel is by far the cheapest for hot water heating.

Heat Storage Cookers

Heat storage cookers are designed for coke firing and give excellent results. All heat losses in this type of installation are reduced to a minimum by thick insulation and thermostatic control of combustion. The coke size to be used is No. 3, and ordinarily entails some 1¼ to 1½ cwt. per week. The installation is pleasing, stands alone and does not require any special building alterations, and with its very high efficiency is a good proposition. The general drawback to this type of heat storage cooker is its initial cost. The installation will provide all the necessary domestic hot water and cooking for an ordinary family for some 1½ cwt. of fuel per week.

Mention must be made of the Stanmore development of two houses, one entirely heated and supplied with hot water by gas, and the other heated and supplied with hot water by coke. The efficiencies of the Radiation house warming appliances were found to be 2½ to 3 times those of an open coal fire, with gas efficiency at 75% and solid fuel between 65% and 80%, according to the load. The advantage of complete house warming, such as this instal-

Mr. D. P. Welman, Chairman of the North Western Gas Board (at the microphone, left) addresses the area general meeting of the Board's Salesmen's Circle at Manchester. Some 700 Circle members heard Mr. J. Waterhouse, Coke Sales Officer of the Liverpool Group, present his paper on 'Coke Efficiency.'

lation, is that any room can be occupied at all times in comfort. There is thermostatic control, so that the temperature can be controlled within the limits of 3°F.

The solid fuel unit is self-contained. A good standard of hot water is maintained, upwards of 50 gal. of water at 140°F. being available per 24 hours, much above the Egerton standard of 250 gal. per week. The rating of the furnace for space heating and hot water supply is approximately 35,000 B.Th.U. per hour at full output. This system of whole house heating is a great improvement on traditional methods. It has had extensive service and has proved that coke has given the same overall results as gas.

The public has become increasingly aware of the advantage accruing from the use of continuous burning appliances (which are always more efficient when using smokeless solid fuel rather than bituminous coal) and coke grates. Unfortunately the introduction of cheap nutty slack has persuaded the public to use this slack on appliances designed for coke. While being inconvenient and producing much smoke, this fuel is totally inefficient for the domestic use to which it is put. Many of these solid fuel appliances, sold free of purchase tax and designed essentially for the consumption of smokeless fuel, are being used to burn bituminous fuel with an efficiency lower than the old-fashioned grate burning coal.

Considerable progress in the development of both coal and coke burning appliances—industrial and domestic—has been made and higher efficiencies have been obtained in the last few years, but smoke remains a product of coal burning. The open fire remains the most popular means of heating a living-room, and when fitted with an overnight burning attachment, suitably aircontrolled and gas-ignited with coke, it satisfies popular demand. When this type of coke fire is fitted with a back boiler it has an improved performance and can be used in conjunction with one or two hot water radiators, the number and size, etc., depending upon the size and type of fire.

Although at the present time the sale of closed and openable stoves is not very popular, there is no doubt that when using coke they give the highest possible efficiency, with no sooty deposits soiling the heating surface. They have a high efficiency burning overnight, with a very low fuel consumption of some ½-lb. of fuel per hour (sometimes less), and guarantee a comfortably warm room in the morning. Nearly all models provide radiation and convection, and with the doors open give that cheerful appearance so pleasing to the British public.

The marketing of coke must have its special organisation, and the closest co-operation must be maintained with the public and merchants. The export business requires special consideration. This country produces each year for sale some 12,280,000 tons of gas coke, and some 2,748,000 tons of breeze, which results in a revenue of £55,626,120.

The merchants sell roughly half the gas coke produced and they should be regarded as collaborators, not competitors.

INDUSTRIAL GAS

FROM A PAPER TO THE MANCHESTER DISTRICT JUNIOR ASSOCIATION OF GAS ENGINEERS, DECEMBER 9, 1953, BY

J. PALMER,

A.M.I.Mech.E., A.M.I.Prod.E., Liverpool Group, North Western Gas Board.

THE industrial gas engineer is the 'contact man' with the customer and must always guarantee good service. To do this he becomes a liaison officer between departments. If he cannot sell gas, then wherever possible he must sow the seeds for selling coke. In Liverpool we have a technical Coke Officer, and in no way do we interfere with his job, but generally introduce him or give him the name of the contact so that he can make the correct sale. Close contact in this way leads to good relations between departments and eliminates the chance of too many people calling haphazardly on the same customer.

Effect of Price Increases

Since the recent increases, in January, 1953, and March, 1953, quite a number of customers have been perturbed at the size of their gas bill. In many cases, where a large proportion of the load is for heating and process steam, the cost of gas has increased from 10d. per therm to 14.75d. per therm in the period from March, 1952, to March, 1953. This shows an increase of 47.5% in 12 months (while oil prices have decreased). It has caused the customer to consider using other fuels.

Several large organisations have protested strongly against these recent increases. The Board has considered the protests and reviewed the tariffs, with the result that certain customers will benefit. However, once a load is lost to gas, it will remain lost for a considerable time; and no matter how much confidence the customer has in the industrial engineer, he will not spend more capital to revert to gas once he has changed over and has new plant in good working order.

In 1950 a firm was interested in raising steam for food preparation. After negotiations with the management, it was decided to install a gas-fired boiler. The boiler installed was a Cochran 9C Sinuflo, evaporation 1,330 lb. per hour. Over two years that followed, apart from one quarter, there has been a steady increase in gas consumption. The boiler has been used nearer to its maximum output in each proceeding quarter, until the last quarter when it was running on full load for about 14 hours per day. Recently the manager complained of lack of steam in the factory and on investigation it was found that during certain periods of the day the demand was too great.

To satisfy the customer that the boiler was working efficiently, a test was carried out, the results of which showed the boiler to be working to an efficiency of 72%.

A Win for Coke

The cost per lb. of steam had increased from 0.158d. to 0.235d. On the quantity of gas used at the present time and at the price operating in November, 1951, the cost per lb. would have fallen to 0.152d. The additional increase has caused the customer to look elsewhere for a cheaper fuel, and he has recently bought a marine-type boiler which can use either oil or solid fuel. He has been introduced to the Group Coke Officer and intends trying coke. On the customer's calculations, he will pay for the boiler (which he bought cheaply) and the installation inside two years on the saving in fuel costs. This has to be proved. The cost of gas for this process compared with the cost of the finished product is less than 1%.

In about three years a load had been won and lost, but in many cases years elapse before any reward is shown. In 1947 a firm interested in building a factory for the manufacture of copper tubes started negotiations for a 50-acre site with an option on a further 50 acres. After many interviews, it was finally decided on the gas requirements for this factory. A 60,000 cu.ft. B.M. meter was installed in December, 1951, to supply a canteen, several large furnaces, and various incidental appliances. Some five years after negotiations started, gas was used for lighting-up and drying-out the furnaces and the gas consumption rose steadily throughout the year, the total consumption for 1952 being 22 mill. cu.ft. It will be some time before all the plant is in full commission.

The firms at Kirkby are in the main small, and the quantity of gas used per premises is small. Collectively,

(*Continued on p. 42*)

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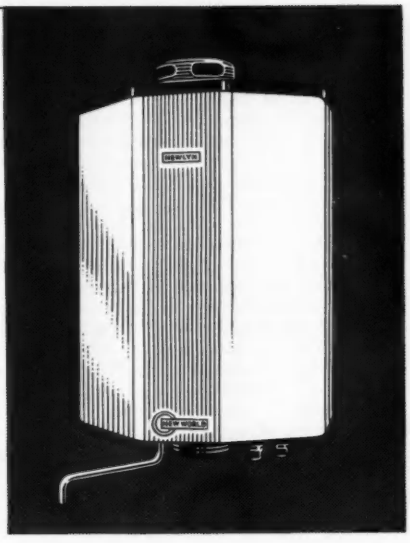

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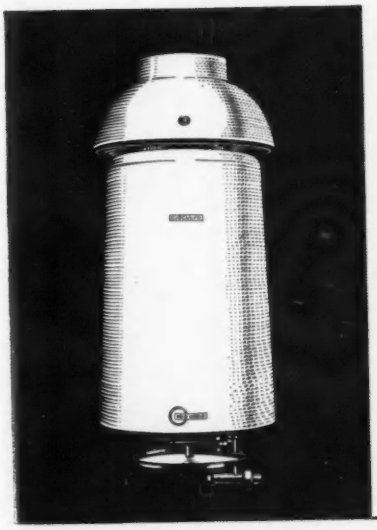

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however, they form a very appreciable load. The consumption for Kirkby for 1952 was 108,835,000 cu.ft. and my estimated consumption for 1953 is between 140 to 150 mill. cu.ft.

To illustrate the size of the firms on the Kirkby Estate, the information in Table 1 is given.

TABLE 1

	No. of customers	Area	Gas consumption cu. ft.	Therms/ Acre	Average cons. per customer cu. ft.
Kirkby ..	73	560	108,835,000	875	1,480,000
Speke ..	31	327	213,905,000	2,944	6,860,000
Aintree ..	22	372	248,310,000	3,004	11,300,000

The average consumption per customer will no doubt increase on the Kirkby Estate, but I doubt if it will compare with that at Aintree.

Another point to note is the gas sales per acre. Frequent use has been made of the term 'Therms per acre,' but it does not give any indication of the intensity of load in the firms situated in the area under review. At Kirkby the figure is low compared with Aintree and Speke, but this is due in part to the nature of the layout. It will be a long time before the building area per acre is equivalent to that of Aintree.

Therms per Acre

Therms per acre can only give an indication of where a concentration of gas is being used, and cannot indicate with any accuracy where unlimited gas sales abound, nor can it indicate how well the area has or has not been covered by the industrial engineers. In one community a factory may have a large gas load while the remaining factories have only a small load or none at all. The therms per acre may seem average, and yet there may be scope for increased load.

A recent survey of Bootle showed that future increased gas requirements were small. Of those firms contemplating using additional gas, most of them were known to the industrial department through the normal channels. A figure of 167 therms per acre would indicate that there is unlimited scope in the Bootle area. Survey shows that the scope is severely limited.

In premises occupied by a firm supplying accounting machines which work to very fine limits, a steady temperature is required both day and night to maintain equilibrium. Paper is one of the chief items used by the firm; and should it become damp in any way, it is useless. A temperature of 65°F. throughout the day and 50°F. throughout the night has solved the trouble. A control panel, consisting of a day-and-night thermostat and a clock controller, is situated adjacent to the boilers. The thermostats are calibrated to give the foregoing conditions, and the gas-fired boilers are set at 180°F. flow temperature. With paper at £50 per roll, and a minimum of 2,000 rolls on the premises, the gas-fired boilers are eyed with favour.

Paint Drying and Other Uses

For paint drying gas can be used satisfactorily. The main point is cleanliness and ease of control. In one factory most of the equipment painted is stove enamelled, using camel-back drying ovens. At another factory an infra-red tunnel is used. Why the difference? When considering the type of drying unit, some of the points to note are the type of article to be dried, the space available, the material to be painted, the production needed, and the capital available.

Recently we were asked to provide the burner equipment for a box oven that a small firm was making. Normally we do not encourage firms to make their own equipment, nor do we like to give them drawings for any type of equipment made by a reputable manufacturer. However, this oven was partly made when we were called in. It was in double-cased sections, with flue and air inlets to our suggestions. On completion, samples were sprayed and dried satisfactorily before production began. After it had given many months of satisfactory service we were again called in. Instead of obtaining a hard

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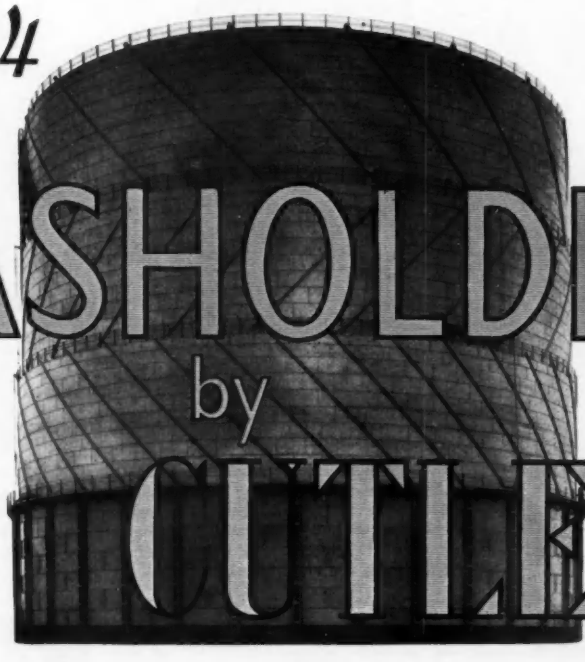

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gloss finish on the parts sprayed, the oven gave a matt finish. The paint manufacturers had been consulted. They said that their paint was all right and that probably the gas was causing the trouble.

We took samples of the gases from the oven and checked for CO and CO_2. Carbon monoxide was *nil* and CO_2 was slightly less than 1%. The gas rate was measured and the oven temperature checked. Samples of the finished product were examined microscopically, and it could be seen that the paint had dried glossy but had an uneven surface. Refraction of light on the uneven surface gave a matt effect. The paint manufacturers then supplied an anti-frost mixture (amyl-acetate or xylene) to be mixed with the paint before spraying. This helped. But the colours were not affected similarly. White was most affected, and then, in lessening degree, cream and grey. During this period the weather had become damper. We attempted to create similar conditions in our laboratory. With every experiment a good finish was obtained. Finally, it was decided to check the air line in the paint shop. It was found that condensation had been allowed to collect in the filter so that the compressed air picked up moisture and sprayed it with the paint. In the oven, the moisture evaporated, leaving an orange-peel effect on the surface.

Liverpool offers excellent facilities for export. One firm taking advantage of this is exporting glassware all over the world. The glassware is in the form of multi-coloured glass marbles or 'glass alleys.' No secret process or highly technical plant is involved in this trade, but it is interesting to see various pieces of coloured glass melted in a tank fired with gas and air-blast burners, small amounts of molten glass being gravity-fed on to oiled square thread rollers, thus forming into a sphere as they are air-cooled before finally being water-quenched.

Hard chrome is an innovation in the engineering world. Crank shafts, piston rings, cylinder linings, boring drills, and many other parts can be treated to give a hard chrome finish and longer life. The process is similar to the ordinary decorative chrome process. Gas is used for heating the chromic acids and the various other tanks. Another use for gas in a factory where the hard chrome process is being carried out is for stoving. The jigs are plastic protected. Wax is commonly used but is not suitable for the heavier jigs. The plastic is dried at a temperature of 300°F. for approximately 30 min.

Copper Wire Coating

Copper wire is insulated by giving it a protective coat of varnish, which, when baked hard, is pliable and homogeneous. In 1946 Connolly's (Blackley), Ltd., bought a site at Kirkby with the view to opening a factory for processing copper wire. Early in 1951 the new factory was started up. Several services were planned to supply gas at points over a wide area. In addition to the existing service and 1,200 cu.ft. meter, three other services were installed—a 4,500 cu.ft. per hour for the canteen block, a 15,000 cu.ft. per hour for the boiler house, and a 20,000 cu.ft. for the enamelling shop. These services have gradually come into operation over the past two years. The gas consumption will no doubt steadily increase. The enamelling stoves fixed in 1946 were electrically heated, but they did not fully meet the requirements of the management. Subsequently the stoves were fitted with electrical elements and gas burners. During the stoving of the enamel inflammable fumes are evolved. These are mixed with air and burned. The electrical elements are used to balance the heat along the length of the heating chamber and to vary the temperature where necessary. This type of stove has been further improved. The fumes from the enamel are now taken up to a solvent recovery plant, then passed down the outside of the flue for pre-heating before burning and passing to atmosphere.

These stoves are horizontal and have a heating chamber varying from approximately 4 ft. to 6 ft. long. To lengthen these machines would take up valuable floor space. The latest machines being installed are vertical and will have a heating chamber length up to 20 ft.

Gas is controlled by a valve of the needle type having a small by-pass rate. This valve operates in conjunction

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with an adjustable thermostat, the controlling medium being compressed air at 6 lb. per sq. in. The gas rate per stove varies from a minimum of 5 cu.ft. per hour to a maximum of 20 cu.ft. per hour. The enamel is heated to a pre-determined temperature in the storage tanks before passing to the stove where the wire is dipped. This temperature must be controlled accurately, and such control can be obtained by installing a gas-fired boiler and circulating hot water or steam through the storage tanks.

The Kirkby Estate, like any other estate, has the problem of feeding the workers. At the start the Corporation used the existing canteens, which were gas-fired, and contracted the catering out on lease to a firm of caterers. This firm runs two canteens for workers and staff and also a residents' club, where personnel can stay and industrialists can meet and entertain their clients. The kitchens are equipped with gas and steam appliances, and 500 meals are prepared each day.

From the evidence found in the area around Liverpool, it seems that there is a lagoon of oil. As a result of geologists' reports, D'Arcy Explorations, Ltd., have started boring at Croxteth, adjacent to the Kirkby Estate, with the hope that they will strike oil in quantity. Natural gas and oil are often found together. Should natural gas be found in any quantity, it will be the answer to the industrial engineer's dream, as this gas may sell at somewhere around 6d. per therm. This price is based on the recent publication of the report by D'Arcy Explorations on piping gas from Persia to France and then to London, selling in the British capital at 6d. per therm.

Concluding, I would say that the industrial load is now over 40% of the total gas sales of the Liverpool Group of the N.W.G.B.

COKE AND THE FUTURE

FROM A PAPER TO THE LONDON AND SOUTHERN JUNIOR GAS ASSOCIATION BY

F. S. EVANS,

Coke Manager, South Eastern Gas Board

THE mild weather of the last few months and the recession in the demand for steel on the Continent have radically changed the fuel supply position. Today there is a larger stock of coke in the Ruhr than at any time since the war. There is a larger stock of hard coke in this country than at any time since the war, and more of the top grades than is required by the steel industry. The Scandinavian countries have enough coke in stock to see them through the winter. Coal stocks in this country are probably by now as high as last year and higher than in any other year since the war. Deliveries of house coal are above quota and in some cases cannot fully be accepted by merchants. Stocks of coal on the Continent are adequate, perhaps with the exception of gas and coking coals. Gas coke stocks are high and still increasing, and supplies of fuel oil are increasing.

It may well be that this is a temporary phase and that fuel demands in 1954 will be as much as or more than in previous years. It may also be a foretaste of the things to come. It may shake the confidence of those who have so boldly asserted that there would never again be an overall fuel surplus in the United Kingdom.

Already the Minister has annulled the Wholesale Coal Prices Order, and conditions of today and tomorrow may well lead him to consider freeing coal and coke from all restrictions. Such a decision would be in line with Government policy in other directions and the general desire to be rid of rationing and controls.

We are told by the economists that if in Great Britain we had to support ourselves from the land, our standard of living would be that of the peasant, and that we could support a population only half what it is today. Maybe this is a measure of the success of the industrial revolution and of our commercial standing. But this very standing is due to a great extent to plentiful and cheap supplies of good coal.

Today our problem is different. We have a larger population and a higher standard of living. On the other hand our national resource, coal, is not so good, not so cheap, not so plentiful. Moreover, our deposits of coal are not inexhaustible. We must make the most of what we use; and it seems that unless there is a marked diminution in the rate of getting coal we shall exhaust the easily worked seams sooner than Germany or the U.S.A.. Already there is evidence that some of the best seams and some of the easily worked are practically worked out.

The Question of Price

Today we are at the stage that, per useful therm (without any allowance for convenience factor) fuel oil is almost as cheap in use as hand-fired coal and coke. I am aware that the National Coal Board is doing its utmost to avoid any increase in pithead prices, but distribution costs are leading to increases in prices to consumers. With oil, however, over the last year or two, there have been several reductions in price. It is a poor reflection on us that it is possible to haul crude petroleum half way round the world from the Middle East, Venezuela or America, distil it in this country, and sell the refined products—and particularly fuel oil—at a price highly competitive with our home-produced fuels.

Some industrialists look for an economic solution of the problem in atomic power. With the breeder pile their hopes in this direction may be justified. But if we as a nation are pinning our future to oil and atomic power, we must realise that we are casting away the natural commercial advantage we have enjoyed in the past from our resources of coal, and that in world competition we should then start level with all other countries. This to me is a very serious change and one that should be receiving attention at the highest level. We need a national fuel policy of wider conception than any that we have yet had.

The root of the trouble lies not only in the high price of coal but also in the low utilisation efficiency which we in so many cases obtain from our coal. In every case with oil, the industrial installation is modern, automatic and thermostatically controlled.

The View of the Industrialist

Of the coal used in this country, 75% is used in industry. Basically the industrialist is not so much concerned with price per ton or per therm as with the cost per unit of his end product. He will pay more for a fuel which reduces 'wasters'; he will pay more for a fuel which permits him to make more profit. Indeed, he might pay more than the cost per useful therm. At least he will judge on the cost of the fuel and the installation and not the cost of the fuel alone. In addition, to lower costs, he will wish to supplement manual labour with as much mechanical aid as is practicable.

Except for a few processes demanding special flame characteristics or rates of heat emissibility, gas is the fuel *par excellence*, but the precise scope of its economic uses is determined largely by the price difference per useful therm compared with other fuels or other forms of energy. If, for example, the price difference between gas and oil is small, gas will have a very wide field of use. But if the price difference is great, then gas has a very limited field of economic industrial use, and in the extreme would be limited to those jobs which gas alone can do.

Today, compared with oil, there is less economy in using solid fuels, particularly hand-fired solid fuels, than

pre-war; and gas is relatively dearer than it was pre-war, though cheaper than it was compared with coal and coke.

In the domestic market the prices of house coal and coke still bear a similar comparison to pre-war. They have, in fact, kept in step. The price relationship between gas and electricity, however, has worsened. Indeed, there is little difference in cost between gas and electricity. Coupled with the widening of the price differential between gas and oil, we are presented with a challenge as great as any the gas industry has faced before.

The major cause of these changes is not any falling-off in the efficiency of gas production or any abnormal rise in the costs over which we can exercise some control. They are due almost entirely to the phenomenal increase in the cost of gas coal. This cost of coal, gross—that is, without deduction for any revenue obtained from coke or other products—represents today in my area 68% of the published price of gas. Before the war it was only 37%. To the South Eastern Gas Board gas coal now costs four times what it did before the war. Other boards are in similar position.

A Pertinent Question

I should be glad to hear from the National Coal Board why gas coal has increased fourfold and house coal only two-and-a-half times its pre-war price. I know from my experience in other fields that, if raw material costs are too high—even if that raw material is the starting point for a product—then the producers will look around to find some alternative material. Today the gas industry —and the Gas Council—are pressing forward with work on complete gasification of coals, including coals not in the highest quality boxes; exploring possible sources of natural gas; taking supplies of coke oven gas and gas from sewage farms, and negotiating for supplies of gas from petroleum refineries; and accelerating work on the gasification of petroleum oils.

There is only one inference to be drawn from these facts. The price of gas coal is too high. Because of high coal costs the present net cost of gas-making materials is precisely the same as the price at which fuel oil is delivered to the larger consumers.

It is axiomatic that the published price of gas represents the cost of its manufacture. The cost of distribution, administration, and overheads is recouped by the revenue for coke and other products. The cost of coal has increased four fold since 1939. The costs of distribution, administration, and the like have increased 60% over pre-war. The cost of gas manufacture, excluding the cost of coal, has increased 114% over pre-war.

There is every evidence that the gas industry has been diligent in keeping down costs. But how can we lower the cost of gas?

The best answer to the foregoing query is to increase consumption, preferably to increase consumption per consumer. The balance-sheet of any gas board shows clearly that some of its costs vary indirectly with the amount of gas made. Some of the costs are in the nature of fixed charges, which in total are very much the same whatever quantity of gas is made or sold. These costs must be recovered by spreading them over the actual therms sold. Of the present published price of gas of 19d., 10d. is the cost of the commodity and the remainder the present assessment of these fixed charges. It is a simple calculation to show the reduced selling prices that might result from the following increases:—

Increase	of	10%	18.2d.
„	„	25%	17.2d.
„	„	50%	16.0d.
„	„	75%	15.1d.
„	„	100%	14.5d.

The ban on promotional advertising has been lifted, and some adjustments (but not enough) have been made in purchase tax on gas appliances. Every endeavour is being made to increase gas sales.

The second method of reducing gas prices is by increasing efficiency in production. The closure of some of the smaller and less efficient works may reduce the cost of gas at those works by 3d. or more per therm; but the proportion of such works, and the fact that replacements involve a capital charge three times that on existing plant, mean that the ultimate result of all such economies may only be a matter of ¼d. or 1d. per therm when spread over all the gas produced by any board.

There is also the question of fuel usage. The replacement of coke by breeze and the like can in some cases result in as much as an additional 1 cwt. of coke for sale per ton of coal, or the equivalent of 1d. per therm. But all efforts can be nullified if the price of coke is reduced by 25s. a ton in order to sell it in the most competitive industrial market—for that would mean an increase of 2d. a therm in gas. Indeed, it can be said that coke may well be the crux of the problem.

It has always been true, whether the carbonising process is operated primarily for the production of gas, as in the gas industry, or for the production of coke for metallurgical processes, as in the hard coke industry, the secondary product—coke or gas—makes a substantial contribution to the operating costs of the process, and in our case this has been an increasing contribution over the years.

Let us take the case of a single London gas undertaking and consider the net revenue for coke per ton and the net cost of coal per ton over the last 50 years. It can be shown that up to 1931, with the exception of times of general solid fuel shortage due to strikes, etc., the revenue for coke per ton has been less than the cost per ton of coal. However, from 1931, which in the South is a significant date as marking the extension of orderly marketing to a wide area, the coke relationship improved. Today the relationship is probably at the highest level.

It can be calculated for the same undertaking that the contribution that coke made towards the cost of gas manufacture over the years is as follows:—

1910	..	¾d. per therm of gas yield
1930	..	1¼d. per therm of gas yield
1940	..	2¼d. per therm of gas yield
1950	..	5·5d. per therm of gas yield

The present contribution, including breeze, amounts to 7.45d. per therm.

A Masking of the Facts

The importance of coke is masked in the form of presentation of gas accounts which has been current for many years. Gas sales revenue is shown at the consumer's meter, but coke and products are the prices received at the retort house. If for the same London undertaking the net revenue for gas at the retort house is assessed—namely, the gas sales revenue less cost of distribution, consumer service, administration, general charges, purification, and boosting, the net figure is approximately 10d. per therm, compared with the net figure for coke and breeze of 7.45d. per therm.

Viewed from the aspect of gross turnover, gas and appliances represent less than two-thirds of the total, and in my old Company—the South Metropolitan—in the accounts for its last year of trading (1948) the gross revenue obtained was as follows:—

Gas	55%
Appliances	5%
Coke and breeze	25%
Chemical products	15%

In other words, the South Metropolitan Gas Company was only 60% a gas undertaking.

If coke commanded no price, the price of gas in the South would have to be increased by over 7d. per therm. The prospects of gas sales would, of course, be materially reduced.

The sale of 100 therms of gas necessitates the sale of 200 therms of coke, 30 therms of breeze, and 20 therms of tar—more or less according to the amount of water gas manufactured. In brief, 250 therms of products have to be sold for every 100 therms of gas made. Obviously the prices obtained from those 250 therms must have a very important bearing on the price that must be charged for the 100 therms of gas.

It is therefore essential that we should give the closest attention to coke preparation and marketing. If we are to

(*Continued at foot of p. 46*)

'WEST'S GAS' ★ ★

In his Christmas message conveyed in the December issue of *West's Gas*, Sir Frederick West says: 'At the end of this Coronation Year we may safely congratulate ourselves that the balance of trade reflects a safer position; not so safe, however, as to warrant any relaxation of effort. In our own industry there is continued expansion contributing to economy in the use of our basic asset, coal. But we still lack a co-ordinated national fuel policy in which all the nationalised fuel industries and industry in general will co-operate to the same end. We are still in the position where a severe winter might lead to domestic hardship and industrial dislocation.'

'Gasworks Electrical Installations' is another in the series of technical articles which is running in *West's Gas*. Written in collaboration with Messrs. W. H. Smith, the electrical contractors who have fitted up several installations of Glover-West vertical retorts in this country with electrical equipment, it discusses in detail the cabling, wiring, and arrangement of lighting and control gear. An interesting example is given in diagram form of a modern electrical layout of switches and wiring for a typical coal and coke handling plant with sequence control for the several lines of conveyor. The panel incorporates a mimic diagram and the sequences are pre-selected and started by push-button control.

Four of the standard types of cable are described and three of them illustrated. In the selection of these and in the design of electrical equipment generally the importance is emphasised of 'intimate and continued collaboration between the electrical installation engineer on the one hand and the gas engineer and other specialists on the other hand.' Cables are now available which will withstand quite high ambient temperatures, but even so the routing should be carefully chosen to avoid these as far as possible. Several interesting types of lighting are described, including the tubular fluorescent unit which has come much to the fore in recent years.

The series 'Our Job' has got to 'Erection and Starting-up.' The careful organisation of this vital stage in the execution of a contract is described in considerable detail—together with some amusing anecdotes. The increasing use of mechanical plant and equipment is stressed with some admirable photographs. Drying-out and starting-up of the retort bench has been fully dealt with in previous publications, notably 'Notes on the Operation of Glover-West Vertical Retorts,' which has been widely circulated among operators and students alike, but this article concludes with an excellent brief summary of this the final job on the site. Not so final though but that 'it remains our job.' West's pride themselves on being ready at all times to collaborate freely with their colleagues of the gasworks in the study of the best means of operation and above all of maintenance, 'ready to consult with them throughout the life of the plant.'

Under 'Company News' is a brief mention of West's participation in the excellent Fuel Efficiency Exhibition held in November in Manchester. We reproduce a page of photographs of their stand. Presentations for long service at the annual meeting of employees included six gold watches for 40 years' service as well as a presentation of savings certificates to Mr. C. F. Smith, foreman maintenance fitter, who recently retired after serving the company for 50 years. An interesting feature of this number is an original account by Captain W. H. Downing, of the *Manchester Shipper*, of the rescue, in company with the *Manchester Pioneer* (Captain A. Starmer), both ships of Manchester Liners, Ltd., of survivors from the American Convair B36 bomber which crashed into the Atlantic last August. The story was told by Captain Downing at an informal luncheon at which he was entertained by the directors of the Line, with Sir Frederick West in the chair. And as usual this Christmas issue carries reproductions of the winning entries for the holiday photographs competition — all excellent pictures.

COKE AND THE FUTURE—(*Continued from p. 45*(

maintain and improve on today's level of coke prices we must:—

(i) Ensure that each district in our area has the same measure of price competition with other fuels (that is, that we have no weak spots due to excessively high coke prices).
(ii) Ensure that coke is used by our customers to the best advantage and thus justify the highest price.
(iii) Be able to use coke with 20% more efficiency than coal or with efficiency equal to oil.

The New Coke Marketing Scheme

The new coke marketing scheme for the five gas boards in the South, which came into effect on November 1, cancels all the multitudinous and anomalous prices we inherited on vesting day and replaces them with a simple schedule with a rational price pattern for the area.

The appointment of authorised distributors who will develop a technical service should ultimately go a long way to ensure that the right coke is used in the right place in the right manner. It should at least mean that all coke customers, whether they buy from a board or through an authorised distributor, should receive a high standard of service and advice. I hope the scheme will prove to be another step forward in the orderly marketing of coke in the South.

In regard to the increased efficiency in burning coke, we must first consider the three main coke markets: Export; industrial and semi-domestic; and domestic.

For the last five years up to 10% of the coke produced in this country has been exported to Scandinavian countries. These exports have been profitable, particularly to those works which can load ships from their works jetty, such as at Beckton and East Greenwich. It is to be remembered that the price relationship between the various fuels in the Scandinavian countries is very different from the position over here. Because of the high price of coke there have been incursions into our market by district heating as well as oil, and on account of these factors, together with the large stocks of coke these countries hold at the moment, and the increasing availability of hard coke from the Ruhr and from this country, it is improbable that the present level of coke prices can be held indefinitely. Maybe we shall have to face the fact before long that this business can be no more profitable than the home market.

The expansion of coke in the industrial and semi-domestic markets took place largely in the days when hand firing was common practice. It has increased latterly due to the shortages of other fuels. Our difficulties lie not only in the fact that this market is sensitive to price relationships—and our price today is 3-3½ times the pre-war figures—but also in the fact that coke, at least until recently, has not been able to play any large part in the present trend of change from hand firing to automatic stoking. This trend has its roots not only in greater mechanisation to assist labour, but more particularly in the economies that can be obtained by automatic regulation of furnaces by thermostatic control, etc. Most of the present automatic stokers are designed expressly for coal—*e.g.*, coking stokers and under-feed stokers. Some are selective in the coals that can be used, and some are suitable for low-grade coals. It should be appreciated that production of small bituminous coals is increasing, and that an increase of 1% of the N.C.B. coal production, if it were used in under-feed stokers to replace coke, would rob us of 20% of our markets. To compete in this field at a comparable price per useful therm, present coke prices would have to be reduced by 20s. to 25s. per ton. And these figures make no allowance for the increased maintenance costs of such appliances when using coke.

Similarly, if all the 6 mill. tons of fuel oil resulting from the 25 mill. ton petroleum distillation programme was sold to replace coke, this would rob us of 80% of our market.

(*To be concluded*)

★ These photographs are reproduced by kind permission of West's Gas Improvement Co., Ltd., from the December issue of *West's Gas*, the house journal of West's Social Society.

Right.— General view

Left.— Working model of West's selective screen conveyor, with Collin coke oven model in background

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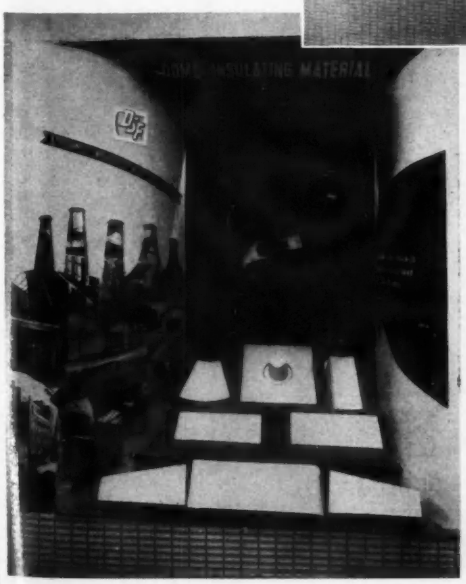

Above.— Working model of carbonisation plant, with models of mechanical producer and sector extractor

Right.— West's Piling and Construction Co., Ltd. exhibit

Left.— Derbyshire Silica Firebrick Co. display

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Gas Workers Wages Rise

THE National Joint Industrial Council for the Gas Industry issued the following statement on December 31: 'A Board of Arbitration appointed by the Minister of Labour and National Service under Section 2 (2) (c) of the Industrial Courts Act, 1919, has awarded an increase of 1 d. per hour in the hourly rates of adult male gas workers coming within the purview of the National Joint Industrial Council for the Gas Industry, to take effect from October 4, 1953.'

The award affects about 95,000 workers and arises out of claims submitted by the National Union of General and Municipal Workers, the Transport and General Workers' Union, and the National Union of Enginemen, Firemen, and Electrical Workers—the three largest unions represented on the National Joint Council. The case was the first of its kind in the history of the gas industry referred to arbitration. The increase will cost the industry about £1,250,000 per annum. The last increase took effect from September, 1952, and amounted to 2d. per hour.

An announcement issued by the East Midlands Gas Board states that price reductions in gas for domestic and industrial consumers recently made by the Board will stand, despite the wage increase. Mr. Sydney Smith, Chairman of the Board, said: 'This is one case where higher operating costs are not being automatically passed on to the consumer. This wage award will cost us £100,000 a year, which, coupled with the cost of £160,000 a year of our recent price cuts, would virtually absorb our 1952 surplus of £279,000.

'My Board, however, stands by its pledge to try to halt the trend of higher prices to the consumer. We hope, moreover, that it will be possible by continued improvements in operating efficiency to carry any further increases in costs which may take place in the immediate future.'

The winter scene background of this Christmas window display at Port Talbot was a painting by Mr. Graham Jones, a Porthcawl gas fitter. Rich and varied colours were used, and the compliments of the season were expressed without reference to gas appliances.

Linking up with an adjoining window display about its 'Hire-a-Fire' service, the Newcastle Division of the Northern Gas Board staged this three-dimensional Christmas card in its main window. Making use of paper sculpture the 8 ft. 6 in. by 7 ft. 'card' showed a gas fire in warm tones at the back of the room. The Christmas tree had flashing lights.

Calendars and Diaries

NEW YEAR greetings have been expressed in many and varied tangible forms, and we take this earliest opportunity in 1954 of offering our appreciation of the calendars, diaries, and other tokens of goodwill received, and of reciprocating the wishes which accompanied them.

From the East Midlands Gas Board we have received a copy of the 1954 *Year Book*, giving a very conveniently arranged list of area, divisional, and district personnel and principal diary events for the year. (Those concerned will be interested to note that the annual staff conference will be held at Skegness on April 29 and 30.) Among gifts received from the contracting and manufacturing side of the industry are the following:—

Allied Ironfounders, Ltd.—Pocket diary for 1954.

Bardsleys - Colchester, Ltd. — Bold figure wall calendar.

British Oxygen Co., Ltd.—The B.O.C. desk diary, including information on the many services rendered by the company to industry.

British Vacuum Cleaner & Engineering Co., Ltd.—Pocket diary and reproduction oil painting wall calendar.

Thomas Broadbent & Sons, Ltd., Huddersfield.—Vest pocket note book.

Edwin Danks & Co. (Oldbury), Ltd.—'A link with Britain's best stoker' in the form of a pair of sleeve links.

R. & J. Dempster, Ltd.—Glass ash tray designed as an object of usefulness and a reminder of the company's services to the gas industry; and set of date cards for the familiar R. & J. D. retort-shaped desk calendar.

Drakes, Ltd.—Refill for pocket diary.

Dunlop & Ranken, Ltd.—Monthly tear-off wall calendar, with a very useful year-at-a-glance diary on the reverse side.

R. & A. Main, Ltd.—Pocket diary and small scissors in pocket case.

Joseph Morton, Ltd.—Wall calendar featuring a reproduction of F. M. Bennett's oil painting, 'Reminiscences.'

Stewarts & Lloyds, Ltd.—Office desk calendar.

Standard Furnace & Setting Co., Ltd., Southport.—Pocket diary.

Richard Sutcliffe, Ltd.—Daily tear-off wall calendar featuring a picture of Whitby Harbour.

West's Piling & Construction Co., Ltd.—Leather bound desk diary.

Widnes Foundry and Engineering Co., Ltd.—Pocket diary.

Hugh Wood & Co., Ltd.—Large pictorial monthly tear-off wall calendar.

Whole House Warming. — In our description in the 'JOURNAL' of December 23 (p. 778) of the whole house warming system installed in new flats at Cardigan Road, Richmond, we omitted to mention the building contractors—the Eden Residential Construction Co., Ltd.

Increased Sulphate of Ammonia Production

THE 33rd ANNUAL REPORT of the British Sulphate of Ammonia Federation, covering the year ended June 30, 1953—the 56th year of propaganda work undertaken successively by the Sulphate of Ammonia Committee, the Association, the Federation, Nitram, Ltd., and Imperial Chemical Industries, Ltd.—shows that in 1952-53, for the first time on record total deliveries by the Federation in home and export markets exceeded 1 mill. tons of sulphate of ammonia. World production of nitrogen increased by over 11%. Industrial usage rose by 14½% and consumption for agricultural purposes by nearly 12%. Although consumption shows a higher rate of increase than production, total supply exceeded demand, as in the previous year, and there was a small addition to world stock.

Development work on grassland by Imperial Chemical Industries, Ltd., was continued and extended with gratifying results. A full programme of demonstrations and conferences was carried through successfully and many thousands of farmers benefited from the advice and factual presentation given. The value of nitrogen in the proper management and utilisation of grassland is now beginning to be appreciated and this knowledge is being profitably applied to a widening circle of farmers in all parts of the United Kingdom. Work is also proceeding on better manuring of cereal crops especially the new varieties which respond well to nitrogen. This work is receiving official support from the National Agricultural Advisory Service of the Ministry of Agriculture.

Many of the wartime restrictions have been relaxed and plans were made for the removal of nearly all the remaining agricultural price controls before the end of 1953. Many new problems resulted and it is not yet clear how freedom from price control of certain commodities, notably feeding-stuffs, will affect future fertiliser sales. The shift of emphasis from milk to meat production has led to investigation of the problems of intensive beef and mutton production and important results are expected from sheep trials now in progress. Grass-fed beef is already making a substantial contribution to home-produced meat supplies.

One new member joined the Federation during the year and one member ceased membership on amalgamation. The number of members at June 30, 1953, remained at 75.

The figures in Table 1, which are expressed in thousands of metric tons of pure nitrogen for 'Fertiliser Years' ended June 30, are compiled from published information available regarding production and consumption of nitrogen.

United Kingdom production of nitrogen products in the calendar year 1952 was 5.6% higher than in 1951. Output of fertiliser products increased by 11.6%, but production for industrial uses decreased by 7.5%.

Table 2 shows the total production of nitrogen products expressed in terms of a standard material containing 25% ammonia=20.6% nitrogen; the last column shows tons of sulphate of ammonia actually produced with a nitrogen content varying from 20.4% to 21.1% N.

The figures in Table 3 are based on nitrogen producers' deliveries against sales within the fertiliser year and show an increase of 50,000 tons nitrogen for 1952/53. After taking into account the heavy carry-over for 1950/51 actual consumption of nitrogen is estimated at 208,000 tons for 1951/52 and at 228,000 tons for 1952/53.

TABLE 1

WORLD PRODUCTION AND CONSUMPTION OF FIXED NITROGEN FOR ALL PURPOSES

Thousands of metric tons (1 metric ton = 0.9842 long ton)

	1952/53		1951/52		1950/51	
	Production	Consumption	Production	Consumption	Production	Consumption
EUROPE (*a*)	3266.9	2806.4	3058.0	2595.5	2707.9	2443.8
Belgium/Luxemburg	181.7	85.0	230.0	89.7	180.9	84.5
France	310.7	317.6	295.2	282.5	273.8	294.4
Germany—Western Zones	719.4	487.5	613.2	423.6	516.9	400.7
Netherlands	247.4	161.2	230.9	158.9	189.1	159.5
Norway	170.3	41.0	172.3	36.8	173.0	36.9
Italy	246.0	223.3	215.0	188.9	177.6	170.0
U.K.	431.7	310.9	413.1	303.4	382.4	295.0
Other Europe (*a*)	959.7	1179.9	888.3	1111.7	814.2	1002.8
ASIA (*b*)	671.0	931.9	521.7	744.4	482.4	683.2
China and Formosa	31.3	152.0	22.5	113.3	15.1	84.9
India and Pakistan	65.1	111.9	24.9	81.0	9.7	75.9
Ceylon	—	15.1	—	14.3	—	13.3
Japan proper	572.0	470.0	471.7	436.9	455.0	435.6
Other Asia (*b*)	2.6	182.9	2.6	98.9	2.6	73.5
AFRICA	37.3	170.6	27.5	166.2	19.4	177.7
Egypt	18.7	107.3	9.3	94.5	0.7	115.6
Other Africa	18.6	63.3	18.2	71.7	18.7	62.1
OCEANEA	18.0	22.2	15.9	26.7	13.5	28.1
AMERICA	2145.7	2109.0	1891.9	1844.6	1774.8	1620.5
U.S.A. (*c*)	1686.0	1946.6	1465.6	1672.3	1321.7	1457.2
Canada	193.0	58.8	181.0	57.0	182.2	50.6
Chile	252.7	10.9	234.8	10.8	265.7	12.1
Br. West Indies	—	8.7	—	10.4	—	7.6
Other American	14.0	84.0	10.5	94.1	5.2	93.0
TOTAL WORLD	6138.9	6040.1	5515.0	5377.4	4998.0	4953.3

(*a*) Including Eastern Zone of Germany and U.S.S.R. (*b*) Including North Korea and Manchuria. (*c*) Including Hawaii and Puerto Rico.

TABLE 2

TOTAL PRODUCTION OF NITROGEN PRODUCTS AND SULPHATE OF AMMONIA IN UNITED KINGDOM

(Long tons of 2,240 lb.)

Calendar Year	England and Wales	Scotland	Northern Ireland	Total	Included in the Total	
					Industrial Ammonia Products	Sulphate of Ammonia as such
1939	783,400	72,400	1,000	856,800	263,900	483,300
1949	1,492,900	196,500	1,700	1,691,100	358,800	924,500
1950	1,595,800	206,000	1,600	1,803,400	505,000	960,700
1951	1,679,800	224,800	1,700	1,906,300	601,500	968,100
1952	1,787,200	223,800	1,500	2,012,500	556,600	1,015,400

TABLE 3

DELIVERIES FOR AGRICULTURAL CONSUMPTION IN THE UNITED KINGDOM

Fertiliser Year	SULPHATE OF AMMONIA ONLY				ALL NITROGEN FERTILISERS		
	Long tons of 2,240 lb.				Metric tons of 2,204.6 lb.		
	England, Wales and Channel Islands	Scotland	Northern Ireland	Total	NITROGEN CONTENT IN		
					Sulphate of Ammonia	Other Forms	Total Nitrogen
1923/24	79,600	41,000	7,400	128,000	26,800	7,600	34,400
1930/31	97,100	39,000	6,300	142,400	29,800	10,400	40,200
1938/39	134,300	38,800	6,700	179,800	37,600	23,000	60,600
1945/46	418,255	97,678	36,269	552,202	115,574	48,889	164,463
1946/47	417,250	99,621	34,337	551,208	115,366	48,700	164,066
1947/48	483,863	109,953	39,100	632,916	132,467	52,943	185,410
1948/49	449,988	105,275	38,516	593,779	124,276	60,828	185,104
1949/50	564,372	136,015	47,728	748,115	156,577	69,083	225,660
1950/51	540,290	125,161	39,499	704,950	147,543	68,384	215,927
1951/52	415,947	103,455	28,205	547,607	114,612	67,382	181,994
1952/53	505,965	102,843	41,449	650,157	136,075	95,098	231,173

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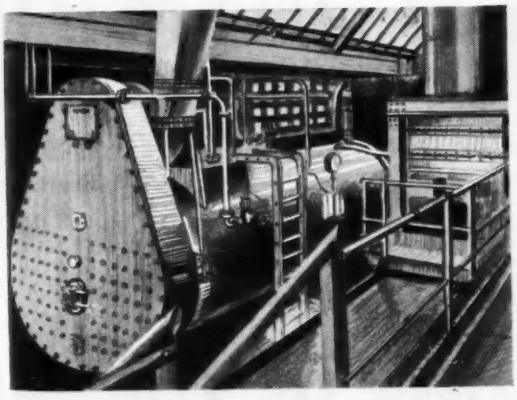

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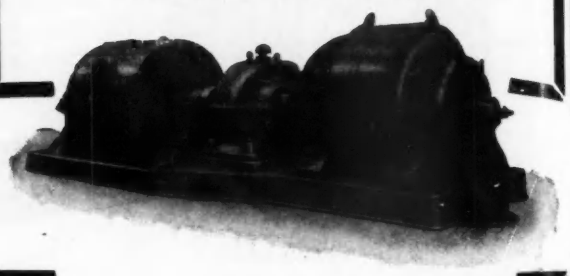

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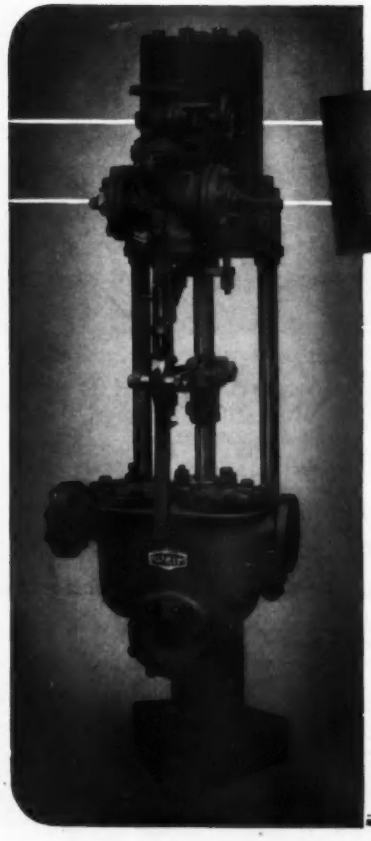

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MIDLANDS MANAGER: G. B. Torrance, 42, Wychall Lane, King's Norton, Birmingham, 30.

NORTHERN MANAGER: W. Q. Foster, 33, St. Helens Road, Harrogate. *'Phone:* Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: CENtral 2236-7. *Telegrams:* Gasking, Fleet, London.

OXIDE

DUTCH AND DANISH BOG ORE
SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright.
Highest prices paid for Spent Oxide.
Send your enquiries to

GAS PURIFICATION & CHEMICAL COMPANY LIMITED
ESTABLISHED 1873

PALMERSTON HOUSE, OLD BROAD STREET, LONDON, E.C.2.

Telegrams: "Purification, Stock, London." Telephone: London Wall 5077

FIRE !
GENII GALORE IN EVERY
NU-SWIFT !

Sealed pressure charges explain the speed, reliability and efficiency of Nu-Swift Fire Extinguishers. Strike the knob—the genii instantly leap out to slay your fire !

NU-SWIFT LTD · ELLAND · YORKS
In Every Ship of the Royal Navy

"KLEENOFF" *
THE COOKER CLEANER

"KLEENOFF"
FIBRE BRUSHES
RUBBER MOPS

"KAY-DEE" *
KETTLE DESCALER

For sale to the public, and in bulk for Works use.

BALE & CHURCH, LTD.
7 CROMPTON WAY, CRAWLEY, SUSSEX.

APPOINTMENTS WANTED AND VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

REPRESENTATIVE aged 40, Assoc. I.G.E. well established connection Southern, South Western, Wales Area Boards, desires represent manufacturers on commission only basis. Apply : No. 177, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

EAST MIDLANDS GAS BOARD

NOTTS. & DERBY DIVISION
HOLDER STATION ATTENDANT—
LONG EATON UNDERTAKING
CASTLE DONINGTON STATION

A VACANCY EXISTS for a HOLDER STATION ATTENDANT on the above station. In addition to duties on the holder station the successful applicant will be required to carry out installation and maintenance work on the district.

The possession of a Driving Licence would be an advantage.

The tenancy of a house is offered on a Service Tenancy Agreement.

The salary will be in Intermediate Grade IV, Prov. 'A', (£405/£450) with Class II Conditions of Service.

Applications stating age, qualifications and experience should be addressed to Mr. J. S. Fox-Andrews, Manager, Nottingham Sub-Division, East Midlands Gas Board, 51/55, Lower Parliament Street, Nottingham, to be received not later than January 14, 1954.

K. L. PEARCE,
Divisional General Manager.

East Midlands Gas Board,
Notts. & Derby Division,
Friar Gate, Derby.

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION
DIVISIONAL TECHNICAL ASSISTANT

APPLICATIONS are invited for the above appointment in the headquarters of the Lincolnshire Division at Lincoln.

Applicants should be well qualified academically and have sound experience of all types of gasworks plant. The successful candidate may be required to travel in the Division and to investigate efficiency in works operation ; to examine schemes for new plant submitted by Group Managers from the technical and economic standpoints, and to initiate and prepare such schemes. The successful candidate will be responsible to the Divisional Engineer.

The successful candidate may be required to pass a medical examination, and unless already subject to a pension scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications stating age, qualifications, experience, present position, and giving the names of two referees should be sent to the undersigned to arrive not later than January 19, 1954.

B. CLARKE,
Divisional General Manager.

East Midlands Gas Board,
Belle Vue House,
Carline Road, Lincoln.
January 1, 1954.

SOUTHERN GAS BOARD

APPOINTMENT OF MEDICAL OFFICER

APPLICATIONS are invited from suitably qualified persons for the position of whole-time MEDICAL OFFICER to supervise and co-ordinate the medical services of the Board and to undertake the day-to-day medical services of part of the Board's area.

Candidates should have had experience of industrial medicine and of administration in this field.

The commencing salary will be in the region of £1,600 per annum, depending on age and qualifications. The appointment is of a permanent nature and the successful candidate will be required to pass a medical examination and join the Staff Pension Scheme.

Applications giving details of age, education, qualifications and experience, together with the names of three referees, should be addressed to the Secretary, Southern Gas Board, 164, Above Bar, Southampton, not later than fourteen days after the publication of this advertisement.

MINISTRY OF FUEL AND POWER

GAS EXAMINERS

THE CIVIL SERVICE COMMISSIONERS invite applications from men and women for about 15 pensionable posts mostly in the provinces, including Scotland and Wales.

Age at least 26 on 1st December, 1953. Candidates must have passed, or been exempted from, the Inter B.Sc. examination in Physics, Chemistry and Mathematics or possess the Higher Grade Certificate (Gas Manufacture) of the Institution of Gas Engineers or have had at least five years' experience in official testing of gas for calorific value, purity and pressure.

Inclusive remuneration in London (Men) £675-£865; (Women) £577-£729. A starting salary above the minimum may be given in appropriate cases. Somewhat less in provinces. Promotion prospects.

Full particulars and application forms from Civil Service Commission, Scientific Branch, Trinidad House, Old Burlington Street, London, W.1., quoting No. S.4281/54. Application forms to be returned by February 4, 1954.

EASTERN GAS BOARD

CAMBRIDGE DIVISION
DRAUGHTSMAN

APPLICATIONS are invited for the position of DRAUGHTSMAN at the Board's Divisional Headquarters at Cambridge.

Candidates should be experienced in installation drawings for gas and chemical works plant, including pipework and either reinforced concrete design or structural steelwork design.

Preference will be given to candidates possessing a recognised engineering qualification, together with experience in the preparation of specifications and the handling of contracts and contract correspondence.

Grading and salary will be within the range of A.P.T. VI and VIII according to qualifications and experience.

The successful candidate will be required to pass a medical examination and join the Staff Pension Scheme.

Applications stating age, qualifications, present position and experience, in chronological order, should be forwarded to the undersigned within fourteen days of the appearance of this advertisement.

J. HUNTER-RIOCH,
General Manager.

52, Sidney Street,
Cambridge.

(*Classified Advertisements continued on page* 54)

APPOINTMENTS VACANT (ctd.)

TECHNICAL SALES REPRESENTATIVE required by manufacturers of well-known Automatic Controls. To cover Industrial Departments of the Gas Boards, Heating & Ventilating Engineers, and large production units. Partly London and partly Midlands and Northern Counties. Good opportunity for energetic and experienced man. Apply in own handwriting, stating age, qualifications, and details of past experience. Apply: No. 178, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

WEST MIDLANDS GAS BOARD

BIRMINGHAM AND DISTRICT DIVISION
PHYSICIST OR ENGINEER—
INSTRUMENT SECTION,
DIVISIONAL LABORATORIES

APPLICANTS should be Corporate Members of the Institute of Mechanical Engineers or the Institute of Electrical Engineers, or equivalent, and will be required to take charge of an instrument section dealing with installation, maintenance and calibration of instruments for the measurement of fluid flow, temperature, pressure, etc. They should also be capable of advising Works Engineers on schemes of instrumentation.

The salary will be within Grade II (£690-£815 per annum) of the National Salary Scales.

The post is pensionable and the successful candidate will be required to pass a medical examination.

Applications, stating age, personal details, qualifications, particulars of training and experience, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Birmingham and District Division, Gas Offices, Edmund Street, Birmingham, 3, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

ASSISTANT DIVISIONAL INDUSTRIAL GAS OFFICERS

APPLICATIONS are invited for the following posts.

(*a*) Assistant Divisional Industrial Gas Officer, North Staffordshire Division, to be stationed at Stoke-on-Trent.

(*b*) Assistant Divisional Industrial Gas Officer, Walsall and District Division, to be stationed at Tame Bridge, Walsall.

Candidates must be thoroughly conversant with general industrial practice; be experienced in heat process application, and possess either the Higher Grade Certificate in Gas Engineering (Supply) of the Institute of Gas Engineers, or other comparable qualifications in mechanical engineering or of the Institute of Fuel.

The salaries for these posts will be in accordance with Grade VII (£545-£625 per annum) of the National Salary Scales for Gas Staffs.

These posts are pensionable and the successful candidates may be required to pass a medical examination.

Applications, stating age, qualifications and experience and giving names of two referees, should be addressed to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 15, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WARWICKSHIRE DIVISION
COVENTRY DISTRICT
ASSISTANT—
INDUSTRIAL GAS DEPARTMENT

CANDIDATES must be experienced in the general application of heat in respect of industrial processes and possess some knowledge of metallurgy.

The salary will be in accordance with Grade V (£460-£540 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate will be required to pass a medical examination.

Applications, stating age, qualifications, experience and present position, together with the names of two referees, should be addressed to Mr. A. Allen, Divisional General Manager, West Midlands Gas Board, Warwickshire Division, Gas Street, Coventry, to reach him not later than fifteen days after the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON AND DISTRICT DIVISION
VACANCY FOR DRAUGHTSMAN
DIVISIONAL DRAWING OFFICE

APPLICATIONS are invited for the above position, which is located at Dudley.

Candidates must have had a good mechanical and structural experience, and a knowledge of Gas Works special requirements would be an advantage.

The salary for the post will be within Grade VIII (£585-£665 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, giving full details of age and experience and the names of two referees, should be addressed to Mr. F. C. Briggs, Divisional General Manager, West Midlands Gas Board, Wolverhampton and District Division, Kensington House, Bath Street, Dudley, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

SCOTTISH GAS BOARD

KILMARNOCK GROUP
DUMFRIES DISTRICT
ASSISTANT MANAGER

APPLICATIONS are invited for the post of ASSISTANT MANAGER with the Dumfries District Undertaking at a salary within Grade A.P.T VI/VII (£490 to £625 per annum), placing according to experience and qualifications.

Applicants should be fully conversant with the operation and maintenance of gas works plant and distribution systems. The carbonising plant consists of machine stoked horizontal retorts, which are in process of being replaced with vertical retorts. Experience with Carburetted Water Gas Plants will be an advantage.

If necessary, a House will be made available at a nominal rent.

Applicants should state if their present position is superannuated. The successful candidate may require to pass a medical examination before the appointment is confirmed.

Applications stating age, training, experience and qualifications, and giving names of two referees, should be addressed to the undersigned within fourteen days of the appearance of this advertisement.

S. C. JOHNSTONE,
Sub-Group Manager.

District Gas Works,
Dumfries,
December 19, 1953.

JERSEY GAS LIGHT CO., LTD.

ASSISTANT ENGINEER

APPLICATIONS are invited for the positio of ASSISTANT ENGINEER to the above Company.

Candidates for the appointment must be Corporate Members of the Institution of Gas Engineers or of the Institutions of Civil or Mechanical Engineers and should have had practical experience with Woodall-Duckham Continuous Vertical Retorts and with both high and low pressure distribution systems.

The salary will be £1000 rising to £1200 per annum by four equal annual increments subject to satisfactory services. The successful candidate will be required to pass a medical examination.

Applications stating age, whether married or single, details of qualifications, Training and experience and accompanied by *copies* of testimonials shouldbe addressed to: S.P. Pepin, Esq., O.B.E. B.Sc, M.Inst. Gas. E., Managing Director, 97, Bath Street, St. Helier, Jersey, Channel Islands.
December 30, 1953.

PLANT FOR SALE

FOR SALE—Two secondhand C.3 Vesta Gas Fired Boilers (cast iron type) 1,200,000 B.T.U's per hour each, in excellent condition. Write: No. 176 *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

TWO Bryan Donkin Rateau Turbo BOOSTERS, each 460,000 cu. ft., 25/26 in. water gauge pressure difference, with driving motors 60-h.p., 400/3/50, 2,920 r.p.m., and control gear. Overhauled by makers, not used since.—George Cohen, Sons & Co., Ltd., 58, Wood Lane, London, W.12. *Tel.*: Shepherds Bush 2070.

VACUUM PUMP for Sale, manufactured by Borsig, horizontal double acting valveless type, suitable for dry vacuum. Extraction rate 2,535 cu. ft. per minute, capable of producing 97% vacuum. Powered by and complete with 134 h.p. 380/3/50 drip proof, ball bearing, squirrel cage, Induction Motor. Method of drive, belt, between 8ft. 2in. dia. pump pulley and 28 in. dia. motor pulley.—ABELSON & CO. (ENGINEERS), LTD., SHELDON, BIRMINGHAM. *Tel.*: SHEldon 2424.

PLANT WANTED

WANTED a Tar Distillation Plant, preferably of the latest up-to-date model (secondhand) of 30/40 tons capacity per day. Please write to: Box P.109, *c/o* Streets, 110, Old Broad Street, E.C.2.

WANTED

MERCURY
(QUICKSILVER)

Urgently wanted in any quantity; containers supplied: keenest prices. Also precious and non-ferrous scrap metals in all forms.

BELGRAVE BUYERS (G.J.)
5, Belgrave Gardens, LONDON, N.W.8. MAI. 7513

SCRAP GAS METERS WANTED!
A SPEEDY SERVICE
Sell to those best suited to deal with them.
TOP PRICES PAID
Collection arranged from anywhere in U.K. Truck Loads to our own private siding, Beddington Lane, Southern Region.
Sell to MITCHAM SMELTERS LTD
ROMETAL WORKS, RED HOUSE ROAD, MITCHAM ROAD, CROYDON SURREY
TELEPHONE THOrnton Heath 6101 PRIVATE BRANCH EXCHANGE

THERE'S A CALL FOR MORE BOOSTERS

IT WILL PAY TO SPECIFY HOLMES-CONNERSVILLE

W. C. HOLMES & CO. LTD.

HUDDERSFIELD • LONDON • BIRMINGHAM

Tel: Huddersfield 5280 London: Victoria 9971 Birmingham: Midland 6830

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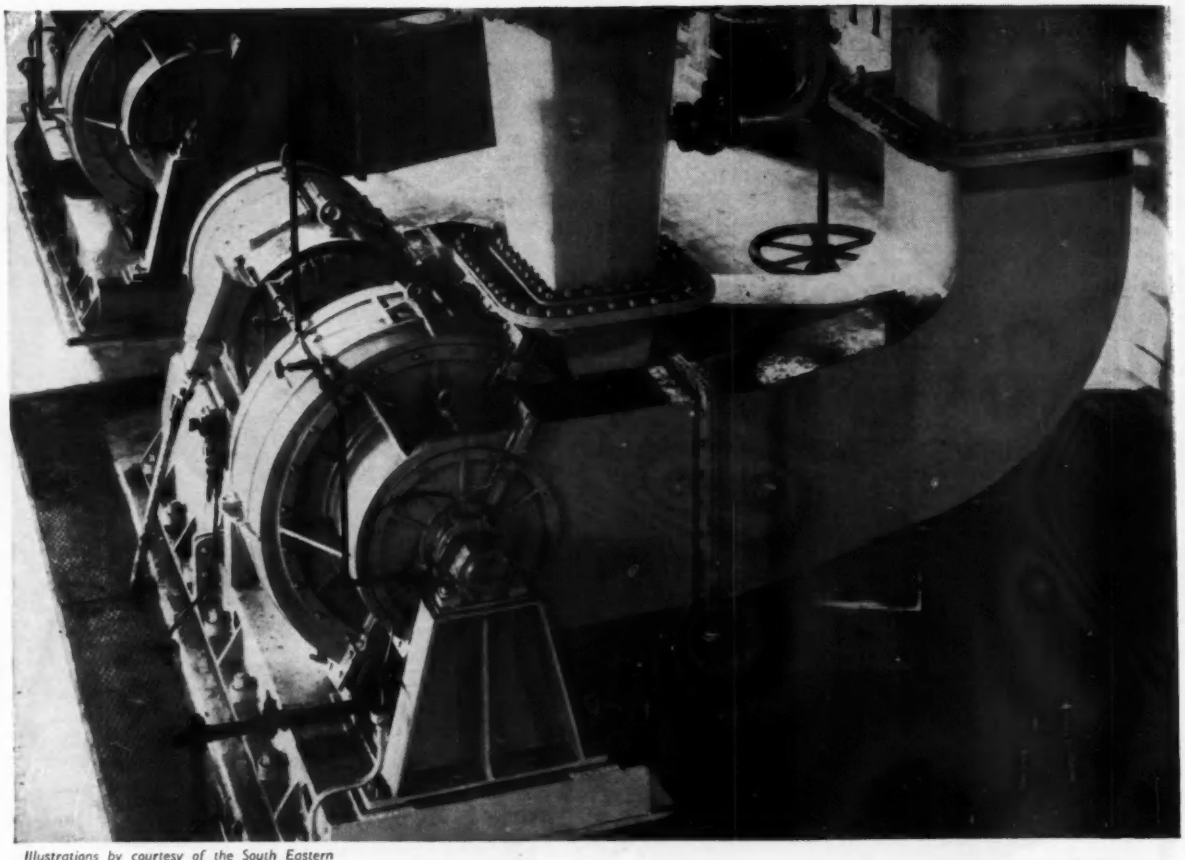

Illustrations by courtesy of the South Eastern Gas Board and Messrs. Humphreys & Glasgow Ltd.

Gas Boosting *

Part of an installation at the East Greenwich Gas Works for the supply of South London's gas are the "TORNADO" gas boosters illustrated above. Each is capable of shifting over a million cubic feet of producer gas an hour, and each was supplied with cast iron gas tight casings with detachable segments for easy servicing, stainless steel impeller and shaft, self aligning roller bearings and flexible couplings. One of the boosters was arranged for motor drive and the other for steam turbine.

*

LARGE ILLUSTRATION: *42" type 9 double width double inlet gas boosters.*
DUTY: 1,095,000 cu. ft. per hour producer gas at 104°F. saturated, giving 28" w.g. differential over inlet and outlet connections taking 138 H.P.

SMALL ILLUSTRATION: *40" type 15 air blowers.*

DUTY:	*Closed outlet*	*Delivery*
Air quantity	*nil*	*12830 c.f.m.*
Speed r.p.m.	*1480*	*1475*
Static pressure	*15.8" w.g.*	*13" w.g.*
Power absorbed	*13 B.H.P.*	*39 B.H.P.*

FAN ENGINEERING AND INDUSTRIAL GAS EQUIPMENT

We are manufacturing gas boosters which cover a range of from 5,000 to 1,500,000 cubic feet per hour, and if you are concerned with the movement of air or gas, ask us to send you Publication No. 5/7, a survey of the standard range of "TORNADO" high pressure blowing and exhausting fans.

Keith Blackman LIMITED

HILL MEAD ROAD, TOTTENHAM, LONDON, N.17

'Phone Tottenham 4522 (twelve lines) 'Grams "Keithblac, Norphone, London."

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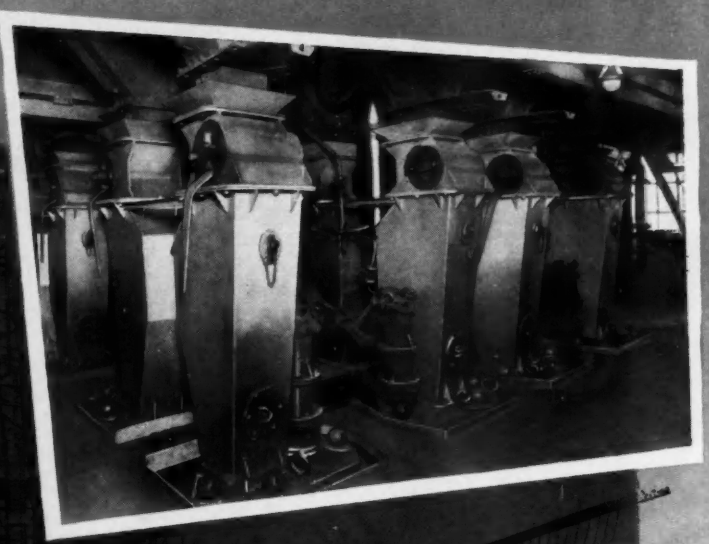
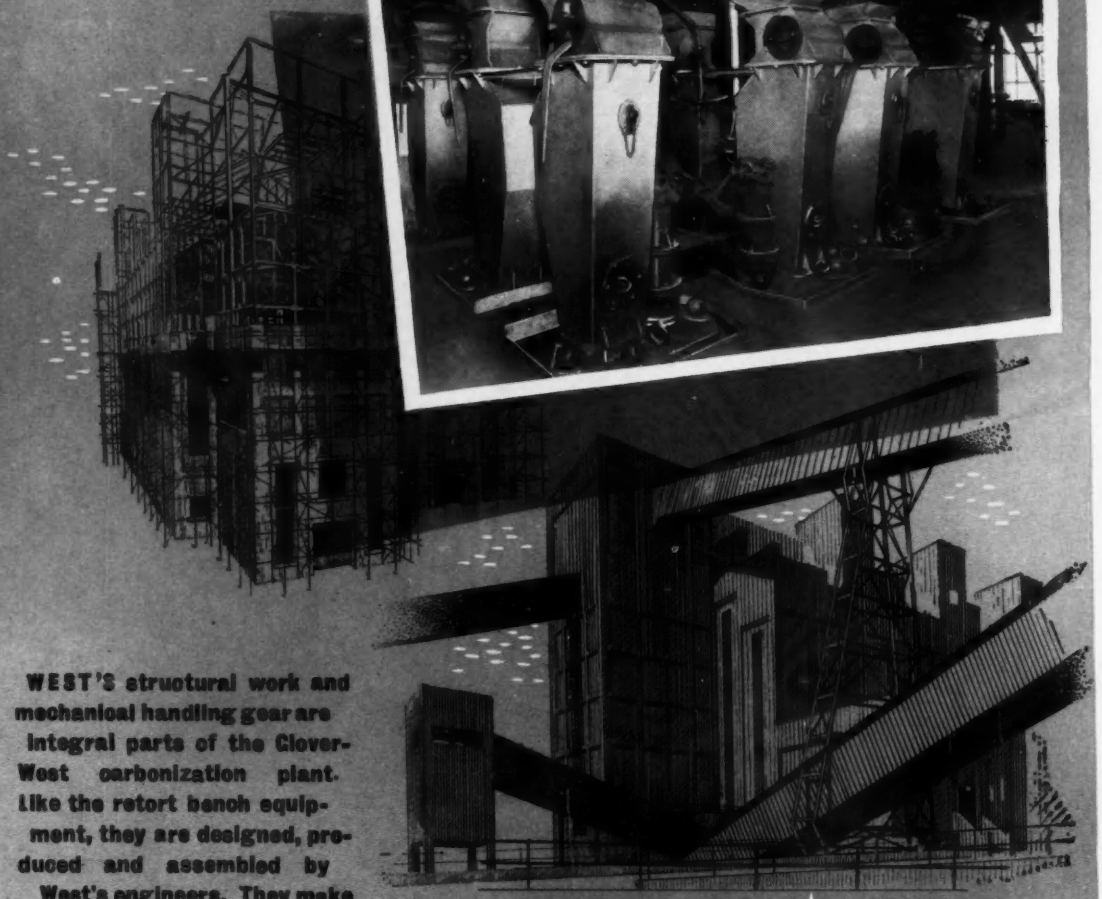
Registered as a Newspaper. Printed by SHAKER BROTHERS LTD., E.C.2 for WALTER KING LIMITED, 11, BOLT COURT, FLEET ST., LONDON E.C.4, Wednesday, January 6, 1954.

Behind the Retorts





WEST'S structural work and mechanical handling gear are integral parts of the Glover-West carbonization plant. Like the retort bench equipment, they are designed, produced and assembled by West's engineers. They make an important contribution to the efficiency of the system. In addition, they provide practical evidence of the availability to the gas industry of an experienced service in the structural and mechanical handling fields.

WEST'S GAS IMPROVEMENT CO. LTD

ALBION IRONWORKS · MILES PLATTING MANCHESTER 10

Telephone: Collyhurst 2961. Telegrams: Stoker, Manchester.

London: Columbia House, Aldwych, W.C.2. Phone: HOLborn 4168. Grams: Wesgasco, Estrand.

SMI

Only gas

used in an

instantaneous water heater

gives an ample flow of

endless hot water that never runs cold

No other appliance and no other fuel gives this service.
When you sell an instantaneous water heater you sell the advantages of **gas!**

ASCOT

Only Ascot Instantaneous Gas Water Heaters are fitted with Stainless Steel Burners — which have cut maintenance costs.

ASCOT GAS WATER HEATERS LIMITED • 255 NORTH CIRCULAR ROAD • LONDON N W 10 • WILLESDEN 5121

A member of the PARNALL Group of Companies